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ABSTRACT

This document contains the proceedings of the National Educational Computing Conference (NECC) 2000. It includes the advance program and registration materials for the NECC. Major themes of NECC 2000 include: connecting technology to teaching and learning; staying connected with professional development; moving beyond the crossroads; teachers as agents for change; connected communities: schools, businesses, and resources; and beyond the crossroads: where do we go from here? The following information is provided: a schedule of events; profiles of keynote speakers; event highlights; descriptions of workshops; and the educational program, including concurrent sessions, papers and posters, and "make and take" sessions. Also listed are the NECC 2000 Conference Committee and Program Committee, exhibitors, tours, and National Educational Computing Association (NECA) board of directors, membership, and societies. Registration information, travel/transportation, and housing reservation materials, tours, workshops, sessions/breakouts, speaker index, NECC 2000 conference and program committees, NECA Board, member society representatives/staff, and special acknowledgments are also included. (AEF)

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NECC 2000: "Connecting @ the Crossroads" (Georgia World Congress Center, Atlanta, Georgia, June 26-28, 2000)

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Introduction from NECC 2000 Chair

How profound that as the world embraces the 21st century we join together at the 21st National Educational Computing Conference (NECC 2000) at Atlanta's Georgia World Congress Center. These research proceedings of *NECC 2000-Connecting @ the Crossroads* project you in to multidimensional crossroads:

- Atlanta's existence is at a *crossroads* of transportation, air, rail, and highway, but most recently *fiber*.
- *Fiber* is providing a *crossroads* bringing together the world, communities, and schools.
- Schools are at a *crossroads* as they determine whether to continue as is, or to choose a new pathway.

And so, you as an individual become the profound nexus to all the others *Connecting @ the Crossroads* and to those you will return to at home.

Just as the information highway is fueled by data, we as educators will find in these proceedings the reports on the presentations, innovations, trends, and research that will assist education in becoming increasingly data-driven. The importance of credible cognitive research *connected* to pedagogical research *connected* to the integration of technology as an instructionally relevant and practical tool will propel us forward to engage each student in achieving success.

Connecting Technology to Teaching and Learning; Staying Connected with Professional Development; Moving Beyond the Crossroads: Teachers as Agents for Change; and *Connected Communities: Schools, Businesses, and Resources* are the major themes of NECC 2000, which will eventually lead us to the ultimate theme, *Beyond the Crossroads: Where Do We Go From Here?*

These themes demonstrated through general sessions, paper sessions, traditional and Internet poster sessions, workshops, and informal networking are the result of the deliberate diligence and expertise of numerous individuals and groups. All of these indomitable people join with me in encouraging you to select the most energizing pathway at *NECC 2000-Connecting @ the Crossroads* that may serve to provide you with the platform from which to launch your students in to success in the new millennium.

Paul Ohme
NECC 2000 Conference Chair

FINAL PROGRAM

NECC ATLANTA 2000

CONNECTING @ THE CROSSROADS

GEORGIA WORLD CONGRESS CENTER
ATLANTA, GA

HOSTED BY

Georgia Institute of Technology's Center for Education Integrating Science, Mathematics, and Computing (CEISMC)

SPONSORED BY

National Educational Computing Association (NECA), Inc.

IN COOPERATION WITH

Georgia Department of Education

Georgia State University College of Education

Georgia Tech Research Institute

University of Georgia College of Education

Alabama State Department of Education

Georgia Educational Technology Conference

Georgia Association of Educators

Professional Association of Georgia Educators

National Education Association

JUNE 26–28, 2000

WELCOME TO NECC 2000

CONNECTING @ THE CROSSROADS"

As the world embraces the 21st century, we welcome you to the 21st National Educational Computing Conference (NECC 2000) at Atlanta's Georgia World Congress Center (GWCC). Three years ago, when our committee welcomed the chance to bring NECC to Atlanta, we recognized how profoundly appropriate it was that we come together at this **Crossroads** in place, time, and revolutionary transformation—the intersection of education, technology, and learning. NECC 2000 is truly a multidimensional **Crossroads**, as

- Atlanta is as a **Crossroads** of transportation: air, rail, highway, and most recently telecommunication technologies.
- Telecommunication technologies provide a **Crossroads** to bring together the world, communities, and schools.
- Schools are at a **Crossroads** as they determine whether to continue as is or choose among paths to engender excellence in learning.

And so, you, as an individual, become the profound conduit to all the others **CONNECTING @ THE CROSSROADS** and to those you will affect when you return home.

As you immerse yourself in many technological, intellectual, and social *connections* over the next few days, know that we are celebrating the educational opportunities that must be afforded all students in the new millennium. Each of us has been entrusted with the responsibility of educating the future workforce and ultimately the political, economic, spiritual, community, governmental, and educational leaders of the 21st century. We encourage you to use **CONNECTING @ THE CROSSROADS** as the platform for *connecting* to credible cognitive research, which is *connected* to pedagogical research, which is *connected* to the integration of technology as an instructionally relevant and practical tool that will propel us forward to help each student achieve success.

We join with you in reveling in the incredible behind-the-scenes magic accomplished by the indomitable energy, dedication, and vision of numerous volunteers we now call friends. We hope this conference will be the personal nexus of your future and the future of your students!

Paul Ohme, Conference Chair
CEISMC, Georgia Institute of Technology

Claudia Huff, Conference Co-Chair
GTRI, Georgia Institute of Technology

Lynne Schrum, Conference Co-Chair
University of Georgia–Athens

Kathy O'Neill, Program Chair
Georgia State University

Anita Best, Program Co-Chair
ISTE (International Society for Technology in Education)

John Richards, Program Co-Chair
Turner Learning

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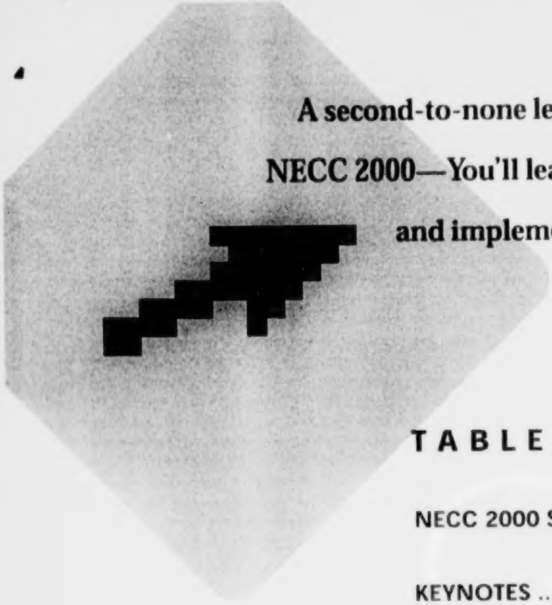

A second-to-none learning extravaganza awaits educators of all levels at NECC 2000—You'll learn strategies and practical solutions for integrating and implementing technology into your educational experience.

Get ready...get set...learn!

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WELCOME TO NECC 2000!

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SCHEDULE OF EVENTS

FRIDAY, JUNE 23, 2000

8 am–5 pm	PT^3 (by invitation), Sheraton Atlanta
5:30–7:30 pm	Registration — GWCC

SATURDAY, JUNE 24, 2000

7 am–7 pm	Registration — GWCC
8 am–5 pm	ISTE Affiliates Meeting, Westin Peachtree Plaza
8 am–5 pm	PT^3 (by invitation), Sheraton Atlanta
8:30–11:30 am	Morning Workshops*
9 am–1pm	Tour: A Taste of the Peach*
9 am–4 pm	Education for a Sustainable Future Symposium* (preregistration only, seats may be available.)
9 am–4 pm	Full-Day Workshops*
1:30–4:30 pm	Afternoon Workshops*
6 pm–12 midnight	Tour: Spectacular Stone Mountain Park*
7–10 pm	Atlanta Braves Game*

SUNDAY, JUNE 25, 2000

7 am–7 pm	Registration — GWCC
8 am–2 pm	PT^3 (by invitation), Sheraton Atlanta
8:30–11:30 am	Morning Workshops*
9 am–3 pm	Tour: Covington's Mansions*
9 am–4 pm	Full-Day Workshops*
9 am–4 pm	Education for a Sustainable Future Symposium* (preregistration only, seats may be available.)
1 pm–5 pm	Tour: Atlanta's Famous Firsts*
1 pm–5 pm	Tour: Georgia's Stone Mountain*
1:30–4:30 pm	Afternoon Workshops*
2:30–5:30 pm	International Visitors' Reception, & Special CNN Tours*, CNN/Omni Terrace
3–5 pm	U.S. Dept. of Education (by invitation), GWCC, Room 366W
5–6 pm	First Timers' Session, GWCC, Ballroom IV
7–9 pm	Opening Reception, GWCC West Concourse Sponsored by NetSchools & Hewlett-Packard Company Open to all NECC Registrants!

MONDAY, JUNE 26, 2000

7 am–6 pm	Registration — GWCC
7:15–8:15 am	First Timers' Session, GWCC, Ballroom IV
8 am–4 pm	Kids' Aerospace Camp*
8:30–9:45 am	Keynote: John Kuglin, GWCC, Hall G Sponsored by Compaq Computer Corporation
8:30–11:30 am	Morning Workshops*
9:45 am–5:30 pm	Exhibit Halls D, E, F Open
9:45–10:45 am	Continental Breakfast in Exhibit Hall Sponsored by AOL.school
10 am–12 noon	Web Poster/Posters, GWCC, Room 367W
✸ 10 am–12 noon	Make & Take Sessions*
10 am–12 noon	Student Showcase, sponsored by HiFusion, GWCC Level 2, opposite Room 265W
10 am–1 pm	Georgia Superintendents & School Board Members Meeting (by invitation), Omni, Mimosa & Rutherford Rooms
11 am–12 noon	Concurrent Sessions 1
11 am–12 noon	DeKalb County Meeting (by invitation), GWCC, Hall G
12:30–1:30 pm	Concurrent Sessions 2
12:30–1:45 pm	ISTE Membership Meeting, GWCC, Room 164W
1–3 pm	Congressional Hearing on Web-Based Education (open), GWCC, Hall G
1–4 pm	"Power to Lead" Simulation, BellSouth Foundation (by invitation), Omni, Mimosa Room
1:30–3:30 pm	Web Poster/Posters, GWCC Room 367W
✸ 1:30–3:30 pm	Make & Take Sessions*
1:30–3:30 pm	Student Showcase, sponsored by HiFusion, GWCC Level 2, opposite Room 265W
1:30–4:30 pm	Afternoon Workshops*
2–3 pm	Concurrent Sessions 3
3–3:30 pm	Refreshment Break in Exhibit Hall
3:30–4:30 pm	Concurrent Sessions 4
5–6 pm	"Thrashers"-of-a-Feather Sessions
5–6 pm	Alabama Tech Coordinators Meeting (by invitation), GWCC, Room 364W
5–9 pm	Atlanta Zoo Extravaganza* Sponsored by Simplexis.com

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* STARRED EVENTS REQUIRE A TICKET AND/OR PREREGISTRATION. CHECK AT ON-SITE REGISTRATION FOR TICKET AVAILABILITY.

GWCC = GEORGIA WORLD CONGRESS CENTER

SCHEDULE OF EVENTS

TUESDAY, JUNE 27, 2000

6:45–8 am ... Fun Run/Walk
Sponsored by PowerSchool, Inc., Centennial Olympic Park

7 am–5:45 pm ... Registration — GWCC

7 am–8 am ... Volunteer Thank You Breakfast, GWCC, Level 1

7:15–8:15 am ... First Timers' Session, GWCC, Ballroom IV

8 am–4 pm ... Kids' Aerospace Camp*

8:30–10 am ... Keynote: Craig Barrett, GWCC, Hall G with special presentation by U.S. Secretary of Education Richard W. Riley

8:30–11:30 am ... Morning Workshops*

9:30 am–5 pm ... Exhibit Halls D, E, F Open

10–10:30 am ... Coffee Break, GWCC West Meeting Room Levels

10 am–12 noon ... Web Posters/Posters, GWCC, Room 367W

✸ 10 am–12 noon ... Make & Take Sessions*

10 am–12 noon ... Student Showcase, sponsored by HiFusion, GWCC Level 2, opposite Room 265W

10:30–11:30 am ... Concurrent Sessions 5

12 noon–1 pm ... Concurrent Sessions 6

1 pm–5 pm ... Tour: Atlanta's Famous Firsts*

1:30–2:30 pm ... Concurrent Sessions 7

1:30–3:30 pm ... Web Posters/Posters, GWCC, Room 367W

✸ 1:30–3:30 pm ... Make & Take Sessions*

1:30–3:30 pm ... Student Showcase, sponsored by HiFusion, GWCC Level 2, opposite Room 265W

1:30–4:30 pm ... Afternoon Workshops*

2:30–3 pm ... Refreshment Break, GWCC, West Meeting Room Levels

3–4 pm ... Concurrent Sessions 8

4–5:30 pm ... NECA LIGHTS Reception (by invitation), Omni, Greenwood Room

4:30–5:30 pm ... Concurrent Sessions 9

5:45–6:45 pm ... "Thrashers"-of-a-Feather Sessions

5:45–6:45 pm ... U.S. Dept. of Ed Assistive Technology Session (open), GWCC, Ballroom IV

5:45–6:45 pm ... Mississippi Dept. of Education Meeting, (by invitation), Hyatt Regency Hotel, Baker Room

6:30–9 pm ... NECC 2000 Predance Minimall
Hyatt Regency Hotel, Regency Ballroom

9–11 pm ... Dance & Conference Social, Hyatt Regency Hotel, Centennial Ballroom
Sponsored by Microsoft Corporation & Compaq Computer Corporation

WEDNESDAY, JUNE 28, 2000

7 am–3 pm ... Registration — GWCC

7:15–8:15 am ... "Thrashers"-of-a-Feather Sessions

8 am–4 pm ... Kids' Aerospace Camp*

8:30–9:45 am .. Keynote: Duane Ackerman, GWCC, Hall G

8:30–11:30 am ... Morning Workshops*

9 am–1 pm ... Tour: A Taste of the Peach*

9:30 am–2:30 pm ... Exhibit Halls D, E, F Open

10–10:30 am ... Coffee Break, GWCC, West Meeting Room Levels

10 am–12 noon ... Web Posters/Posters, GWCC, Room 367W

✸ 10 am–12 noon ... Make & Take Sessions*

10 am–12 noon ... Student Showcase, sponsored by HiFusion, GWCC Level 2, opposite Room 265W

10:30–11:30 am ... Concurrent Sessions 10

11:45 am–1:15 pm ... Luncheon* & Keynote: Betty Siegel, GWCC, Ballrooms I–III
Sponsored by Cisco Systems, Inc.

12 noon–1 pm ... Concurrent Sessions 11

1:30–2:30 pm ... Concurrent Sessions 12

2:30–3 pm ... Refreshment Break, GWCC, West Meeting Room Levels

3–4 pm ... Concurrent Sessions 13

4:15–5 pm ... Closing Giveaways & NECC 2001 Preview GWCC, Hall G

TOURS

Tour participants are asked to meet inside the west entrance of the GWCC 15 minutes prior to the start time of each tour. Tours may be added to your registration through On-Site Registration. Guides will lead participants to the bus loading area.

WORKSHOPS

Seats in workshops may still be available! Stop by On-Site Registration for details. Costs are $70 for half-day and $140 for full-day. Buses will load at the Tours Departure/Return Area outside and to the west of the NECC Registration area between the Georgia International Plaza and the Georgia Dome.

"MAKE & TAKE" SESSIONS

Seats in Make & Takes may still be available! Stop by On-Site Registration for details. The cost is $10. Descriptions are on page 19.

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ALL KEYNOTE SESSIONS WILL BE HELD IN HALL G AT THE GWCC.

JOHN KUGLIN

The Technology Puzzle: Understanding and Connecting the Pieces

MONDAY, 8:30–9:45 AM

John Kuglin is Director of Educational Outreach and Executive Director for NASA's Earth Observing System at the University of Montana-Missoula.

As classrooms transition into the new millennium, technology is a critical tool for schools. However, new developments are occurring at breakneck speeds. Educators find themselves staring into the box of a 5,000-piece technology puzzle. In this presentation, Kuglin will demonstrate the availability of the puzzle pieces and demystify the process for connecting them in a manner that leaves participants feeling comfortable. Kuglin will highlight current and emerging Internet, video, computer, and satellite technologies with suggestions for implementing these tools in a cohesive manner.

DUANE ACKERMAN

Eye for Opportunity

WEDNESDAY, 8:30–9:45 AM

Duane Ackerman is Chairman and CEO of the Atlanta-based BellSouth Corporation.

Ackerman will focus on the enormous opportunities that the information economy and broadband technologies have created for students as learners and future employees, for educators as shapers of technology and technology use, and for communities as the standard-bearers for quality of life. His perspective arises from the breadth of BellSouth operations, which provide telecommunications, wireless communications, cable and digital television, advertising and publishing, and Internet and data services to more than 36 million customers in 20 countries worldwide.

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CRAIG BARRETT

Computers, Connections, and Community: Why We Care and Why It Matters

TUESDAY, 8:30–10 AM

Craig Barrett is President and Chief Executive Officer of the Intel Corporation.

Innovations in technology and innovative educational initiatives are connecting us to the wider world in various ways, and also to one another. Come hear how learning communities (administrators, teachers, students, parents, community-based organizations, and businesses) are collaborating to improve learning and performance, and tie us more closely together.

Barrett's interactive presentation will include demonstrations onstage by teachers from around the country who have incorporated technology in meaningful ways into their classroom curricula, administrators who have used technology in innovative ways to get parents and their local community more involved in education, and a diverse group of students who are involved in making technology happen in their schools.

JOIN INTEL IN HALL "H" IMMEDIATELY FOLLOWING THE TUESDAY KEYNOTE FOR REFRESHMENTS AND AN INTRODUCTION TO MANY OF INTEL'S EXCITING NEW ACTIVITIES!

SPECIAL PRESENTATION BY

U.S. SECRETARY RICHARD W. RILEY

TUESDAY, 8:30–10 AM

BETTY SIEGEL

Connecting for Success

WEDNESDAY LUNCHEON*, 11:45 AM–1:15 PM, GWCC, BALLROOMS I–III

Betty Siegel is the first woman to head an institution in the 34-unit University System of Georgia. She has been President of Kennesaw State University since 1981.

Siegel will bring her remarkable sense of humor and perspectives on how we cope with change and the future to the NECC 2000 luncheon program. She has been instrumental in the inclusion of technology in the teacher preparation program in Georgia and is widely recognized for her vision and leadership.

As Kennesaw State University President, Siegel is focused on the potential of technology to improve and affect education, specifically its impact on the university. She recently hired a Chief Information Officer to ensure that KSU is moving forward to meet the needs of its students and faculty.

** $25 ticket purchase required.*

OPENING RECEPTION

Please join us Sunday night to celebrate NECC 2000's crossroads extravaganza, "Connecting to the Future"! Held in the west concourse of the GWCC, this event will feature food, beverages, and four bands (from mellow jazz to swingin' blues to toe-tapping Dixieland to rock 'n' roll) and is hosted by NetSchools and the Hewlett-Packard Company. Bring your dancing shoes if you like to party, or find a quiet spot to reunite with old friends. Attendance is complimentary with your registration—don't forget to pick up your badge first!

Sunday, June 25, 7–9 pm, GWCC, West Concourse, Levels 1 & 2

SPECIAL FOR FIRST TIMERS

Join us in Ballroom IV to learn how to navigate through the city of Atlanta, the GWCC, the Exhibit Hall, and the conference program. Find out how you can make the most out of your premier NECC experience! Presented by Nancy Clark and Mindy DiSalvo, DeKalb County Schools, Georgia.

Sunday, June 25, 5–6 pm; repeats Monday, June 26, and Tuesday, June 27, 7:15–8:15 am, GWCC, Ballroom IV

INTERNATIONAL VISITORS' RECEPTION AND CNN TOURS

NECC 2000 welcomes our international attendees to a reception at the Omni Terrace at CNN's global headquarters! Right next to the GWCC, CNN develops and produces programming for 24 news and multiple non-news channels targeted to audiences around the world as well as programming and technology resources for education. The reception will feature presentations by Turner Learning and the CNN International Channel. A NECC First Timers' video will also be presented.

In addition, for an extra fee, you may choose to preregister for one of the CNN Studio Tours set aside especially for NECC international participants during the reception. There are a limited number of slots for tours, so acceptance will be on a first-come, first-served basis. tickets must be purchased at On-Site Registration prior to the Reception. No tour tickets will be sold at the Omni or at CNN.

The Standard Tour includes stops in the interactive exhibit area, digitally enhanced control room theater, and special effects studio. View the main newsrooms of CNN and Headline News from a glass overlook, one floor above. **$8.**

The VIP Tour is more in-depth and personalized than the Standard Tour and includes visits to the actual newsroom floors of CNN Headline News, CNN Sports Illustrated, CNN International, and CNN Interactive. **$25.**

Sunday, June 25, 2:30–5:30 pm, Omni Terrace, Omni Hotel. Tour start time is 4:30 pm.

THE NECC EXHIBIT HALL—LARGEST OF ITS KIND IN THE COUNTRY!

Be sure to visit the largest national education-technology exhibit in the country, featuring 1,200+ booths and more than 350 companies! Refer to the NECC 2000 *Exhibit Guide* (in your registration packet) for a complete listing of NECC 2000 Exhibitors and descriptions of each. Take your first stroll through this record-breaking exhibit during the Morning Continental Breakfast, and return for a relaxing ice cream, pretzel, popcorm, and refreshment break that same afternoon.

Continental Breakfast in Exhibit Halls D, E, F, Monday, June 26, 9:45–10:45 am; Sponsored by AOL.school.

Refreshment Break in Exhibit Halls D, E, F, Monday, June 26, 3–3:30 pm

STUDENT PERFORMERS

Student Performers from DeKalb County (Georgia) Schools will provide entertainment before the Monday and Tuesday keynote sessions (8–8:30 am) and the Wednesday conference luncheon (11–11:45 am). School names and performer names will be included in each day's conference newsletter. We hope you'll turn out early to show your support and give 'em a hand!

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WHAT'S IN YOUR BAG?!

Check it out! Thanks to Apple for providing NECC with amazing tote bags for each attendee. Each bag contains the following goodies:

- *National Educational Technology Standards (NETS) for Teachers, first edition*
- *Commemorative NECC 2000 CD-ROM*
- ISTE Catalog
- CoSN Membership Brochure
- *Clipboard (IBM Global Education, TIVOLI, and Lotus Development)*
- *Custom Note Pad (PowerSchool, Inc.)*
- *Day Planner (Edmark)*
- *3-Color Highlighter (Intel Corporation)*
- *Pen (National Computer Systems)*
- *Post-It Note Pad (Knowledge Adventure)*
- *CD Caddy (LearningPays.Com)*
- *Name Badge Lanyards (Compaq Computer Corporation)*
- *Luggage Tag* (Follett Software Company)*
- *Screen Sweep (Follett Software Company)*
- *Pen (Riverdeep Interactive Learning)*
- *Mouse Pad (Palm, Inc.)*
- *Mouse Pad (Scholastic Internet Group)*
- *Name Badge Holder* (TimeCruiser)*

* TIP! SLIP YOUR BUSINESS CARD OR ID INSIDE AND ATTACH TO THE STRAP OF YOUR CONFERENCE TOTE BAG FOR EASY IDENTIFICATION DURING THE CONFERENCE...

WEB COMMISSION HEARING

The Web-Based Education Commission will hold a hearing on *The Promise of the Internet to Empower K–12 Learners.* Nebraska Senator Bob Kerrey is the chair, and Rep. Johnny Isakson of Georgia is the vice-chair. Witnesses will participate in a facilitated dialogue covering K–12 technology-related issues, including online schools, online courses, professional development, standards and assessment, accreditation, access for underserved populations, online privacy, and evaluation.

Monday, June 26, 1–3 pm, GWCC, Hall G

MONDAY NIGHT ZOO EXTRAVAGANZA

Get wild at our Monday night event at the Atlanta Zoo! Visit Yang Yang and Lun Lun, the zoo's recently acquired giant pandas, along with a host of other marvelous animals. Join us for a delicious array of food and beverages while you visit Atlanta's animal friends. $25 per person includes transportation to and from conference hotels and GWCC. Please check at On-Site Registration for ticket availability. Sponsored by Simplexis.com.

Monday, June 26, 5–8:45pm. Shuttles will provide continuous service between hotels and the zoo, 5–9 pm.

TUESDAY FUN RUN/WALK

Start your morning off right with a brisk walk or run! Space is limited and will be on a first-come basis. Each participant will receive refreshments. The first 300 to register will also receive a commemorative T-shirt following the event. Sign up on-site at the NECC 2000 Information Booth located in the main registration area at the GWCC. Free to all NECC 2000 attendees. Sponsored by PowerSchool, Inc.

Tuesday, June 27, 6:45–8 am. Please confirm run location and busing schedule at the NECC 2000 Info Booth when signing up.

TUESDAY PREDANCE MINIMALL

Go on a shopping expedition hosted by a selection of NECC 2000 exhibitors at the Hyatt Regency Atlanta. No sales are allowed on the floor of the primary conference exhibit, so the NECC 2000 Minimall is your chance to purchase software, hardware, and materials to take home with you. Sack-sitting will be provided by the Hyatt for those attending the dance (fee applies). Entrance is free to all NECC 2000 attendees.

Tuesday, June 27, 6:30–9 pm, Hyatt Regency Atlanta, Regency Ballroom. Shuttles will provide continuous service between the Hyatt and other conference hotels, 6:30 pm–12 midnight.

TUESDAY DANCE/SOCIAL

NECC 2000 would not be complete without a dance-'til-you-drop party! Our Microsoft- and Compaq-sponsored event will feature "Music in Motion," one of Atlanta's most popular dance bands. Each attendee will receive tickets good for two hosted drinks of his or her choice (including beer, wine, and call-brand drinks) and each is invited to indulge his or her late night sweet tooths at our sumptuous dessert buffet (French pastries, chocolate fruit fondue, and dessert cheeses) with gourmet coffees. Free to all NECC 2000 attendees.

Tuesday, June 27, 9–11 pm, Hyatt Regency Atlanta, Centennial Ballroom. Shuttles will provide continuous service between the Hyatt and other conference hotels, 6:30 pm–12 midnight.

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WEDNESDAY CONFERENCE LUNCHEON WITH BETTY SIEGEL

The conference luncheon includes your choice of Mexican/chicken or Mediterranean/ vegetarian wraps, coffee or tea, and a taste-tempting dessert. Our speaker will be Betty Siegel, President of Kennesaw State University in Georgia. $25 ticket purchase is required, and space is limited. Check with On-Site Registration for ticket availability.

Wednesday, June 28, 11:45 am–1:15 pm, GWCC, Ballrooms I–III

"THRASHERS" (BIRDS)-OF-A-FEATHER

Informal opportunities for those with common interests to gather and exchange ideas will be offered twice during the conference. Please see pages 33 and 48 for a listing of titles and room locations at the GWCC. Additional topics will be announced in the daily newsletter and at the NECC Information Booth.

Monday, June 26, 5–6 pm, and Tuesday, June 27, 5:45–6:45 pm

STUDENT SHOWCASE HIGHLIGHTS INNOVATIVE PROJECTS

All attendees will have an exciting opportunity to see examples of what schools are doing with technology. Students will present creative projects that use technology to facilitate learning. Questions will be answered and handouts will be provided. See great ideas successfully implemented!

Monday, June 26, and Tuesday, June 27, 10 am–12 noon and 1:30–3:30 pm; Wednesday, June 28, 10 am–12 noon; GWCC, Level 2, opposite Room 265W
Student T-shirts and refreshment breaks sponsored by HiFusion, Inc.

AWARDS AND PRESENTATIONS

Each year at NECC, we are pleased to recognize and present a number of honored student and educator awards during the keynote sessions (8:30–9:45 am):

Monday, June 26, 2000

- Compaq Education Grants, sponsored by Compaq Computer Corporation.

Tuesday, June 27, 2000

- ThinkQuest Junior Team, sponsored by Advanced Network & Services. Congratulations to "Best-of" Contest winners: teachers Cynthia Lang and Amy Gill-Price and students Chelsea, Lianna, Timothy, Daniel, Colin, and Justin.
- Multimedia Mania, sponsored by ISTE's HyperSIG. The winning teachers are presenting *Multimedia Mania*, Tuesday, 1:30–2:30 pm, Room 165W. Congratulations, Mark Rice, Stringer, Michigan; Arnie Covey, Waterloo, Ontario, Canada; and Mary Sippel, Neufane, New York.

Wednesday, June 28, 1999

- Research Paper Award sponsored by ISTE's SIGTE. The winners, Kara Dawson and Aileen Nonis, will present a session based on their paper, *Preservice Teachers' Experiences in a K-12/University Technology-Based Field Initiative: Benefits, Facilitators, Constraints, and Implications for Teacher Education*, Wednesday, 10:30–11:30 am, Room 158W.
- 2000 Outstanding Technology-Using Leader Award sponsored by ISTE. Congratulations Richard Feutz, Northwest Council for Computers in Education, Brainbridge, Washington!
- 2000 Outstanding Technology-Using Educator Award sponsored by ISTE. Congratulations Sharon Dollice, Michigan Association for Computer-Related Technology Users in Learning, Grand Rapids, Michigan!
- Leadership in the Classroom Award, sponsored by Tech Corporation. Congratulations, Joan Kay Goble, Camelton, Indiana, and Susan Hedlun Flentie, Lewiston, Montana!

AUXILIARY MEETINGS/ACTIVITIES

- PT^3 GRANTEES MEETING (BY INVITATION), THURS., JUNE 22, 5–7 PM; FRIDAY–SUNDAY, 8 AM–4 PM, SHERATON ATLANTA HOTEL
- EDUCATION FOR A SUSTAINABLE FUTURE SYMPOSIUM (PREREGISTRATION ONLY, SEATS MAY BE AVAILABLE.) SATURDAY–SUNDAY, JUNE 24–25, 9 AM–4 PM, OMNI HOTEL, BARRINGTON ROOM
- ISTE MINORITY LEADERSHIP SYMPOSIUM (BY INVITATION), SATURDAY, JUNE 24, 9 AM–5 PM, WESTIN PEACHTREE PLAZA.
- COMPUTER SCIENCE AND INFORMATION TECHNOLOGY SYMPOSIUM 2000 (BY INVITATION), SUNDAY, JUNE 25, 8:30 AM–5:30 PM, WESTIN PEACHTREE PLAZA
- ISTE LEADERSHIP SYMPOSIUM 2000 (BY INVITATION), SUNDAY, JUNE 25, 8 AM–6:30 PM WESTIN PEACHTREE PLAZA
- U.S. DEPARTMENT OF EDUCATION (BY INVITATION), SUNDAY, JUNE 25, 3–5 PM, GWCC, ROOM 366W
- GEORGIA SUPERINTENDENTS & SCHOOL BOARD MEMBERS MEETING (BY INVITATION) MONDAY, JUNE 26, 10 AM–1 PM, OMNI, MIMOSA & RUTHERFORD ROOMS
- DEKALB COUNTY MEETING (BY INVITATION), MONDAY, JUNE 26, 11 AM–12 NOON, GWCC, HALL G
- CONGRESSIONAL HEARING ON WEB-BASED EDUCATION (OPEN), MONDAY, JUNE 26, 1–3 PM, GWCC, HALL G
- "POWER TO LEAD" SIMULATION, BELLSOUTH FOUNDATION (BY INVITATION), MONDAY, JUNE 26, 1–4 PM, OMNI, MIMOSA ROOM
- ALABAMA TECH COORDINATORS MEETING (BY INVITATION) MONDAY, JUNE 26, 5–6 PM, GWCC, ROOM 364W
- NECA LIGHTS RECEPTION (BY INVITATION), TUESDAY, JUNE 27, 4–5:30 PM, OMNI, GREENWOOD ROOM
- U.S. DOE SESSION ON ASSISTIVE TECHNOLOGY, TUESDAY, JUNE 27, 5:45–6:45 PM, GWCC, BALLROOM IV
- MISSISSIPPI DEPARTMENT OF EDUCATION MEETING (BY INVITATION), TUESDAY, JUNE 27, 5:45–6:45 PM, HYATT REGENCY HOTEL, BAKER ROOM

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INTEGRATING EDUCATION TECHNOLOGIES FOR A SUSTAINABLE FUTURE SYMPOSIUM

Attention K-12 Teachers & Administrators! Discover how you can be part of equipping students throughout the nation with the skills, knowledge, character, and vision they need to become productive citizens who contribute to a sustainable, information-rich future.

Seats may still be available in this two-day preconference event presented and organized by Education for a Sustainable Future, Cobb County's Technology Innovation Challenge Grant, and The Center for a Sustainable Future (a division of Concord Consortium).

This event will showcase:

- the integration of technology into performance-based units on sustainability,
- leading-edge professional development opportunities, and
- Web-based dissemination strategies.

Participants will take part in:

- large-group sessions with input from leading educational technology specialists, software developers, pedagogical experts, and international leaders in sustainability;
- interactive presentations given by K-12 classroom teachers who have developed and implemented a variety of multidisciplinary units;
- opportunities to learn about exciting new netcourses for teachers and students that will be available as pilots for Fall 2000, and
- small group, hands-on lab sessions that will introduce participants to several new, freely-available software packages.

DATE/TIME: June 24–25, 9 am–4 pm (breaks included, lunch on your own); **LOCATION:** Omni Hotel, $50. Space is limited to 100 participants.

CEU AND SDU REGISTRATION

Continuing Education Units (CEUs) and Staff Development Units (SDUs) will be offered by the Georgia Staff Development Council and Georgia State University Continuing Education. Information and registration is available at On-Site Registration during the dates and times listed below.

CEU/SDU Registration Hours: Monday, June 26, 2–5 pm; Tuesday, June 27, 10 am–5 pm; Wednesday, June 28, 9 am–12 noon

(ISTE) INTERNATIONAL SOCIETY FOR TECHNOLOGY IN EDUCATION SOCIETY MEMBERSHIP/ BUSINESS MEETINGS

For membership information, please visit ISTE's Web site: www.iste.org

ISTE Affiliates Meeting	Saturday, June 24, 8am–5pm, Westin Peachtree Plaza

The following meetings will be held at the GWCC, Room 164W.

ISTE Membership Meeting	Monday, June 26, 12:30–1:45 pm
HyperSIG–Multimedia/Hypermedia	Monday, June 26, 3:30–4:45 pm
SIGTC–Technology Coordinators	Tuesday, June 27, 10:30–11:45 am
SIG/Tel–Telecommunications	Tuesday, June 27, 1:30–2:45 pm
SIGTE–Teacher Educators	Tuesday June 27, 3–4:15 pm
SIGCS–Computer Science	Wednesday, June 28, 10:30–11:45 am

NECC KIDS' AEROSPACE CAMP AT GEORGIA TECH

This three-day, supervised science program for youth entering Grades 4–8 will take place on the Georgia Tech campus, 8 am–4 pm, June 26–28. Transportation to and from the GWCC will be provided. **Please note that on-site registration for this event will not be available.** See page 12 for more details.

CLOSING SESSION

CHICAGO NECC

Join us for a preview of Chicago's **NECC 2001: Building on the Future**, and for a drawing of special prizes including hardware, software, and an airfare/registration package for NECC 2001! Must be present and have photo ID to win.

Wednesday, June 28, 4:15–5 pm, GWCC, Hall G

NECC EVENT TICKETS

Participants taking preregistered tours and events will receive event tickets along with their registration badges. For workshops, Make & Take sessions, the conference luncheon, tours, and the zoo, your event ticket is all you need to present at your event to gain admittance. Those attending the Saturday night Braves game need to exchange their badge ticket for a stadium ticket at at the Event & Workshop Tickets Counter at On-Site Registration. Tickets may be available for some events, including workshops. Please check at On-Site Registration.

"ASK ME" INFORMATION VOLUNTEERS

Teams of NECC 2000 volunteers will be available during the conference to provide attendees with quick answers, directions, and other guidance as needed. Look for the purple "Ask Me" signs!

ATLANTA AMBASSADORS

Downtown Atlanta is a safer, cleaner place to visit because of the Downtown Improvement District's Ambassador Force, a 50+ person hospitality/security group that helps the Atlanta Police Department patrol downtown and also assists visitors with helpful information about the city. Look for team members wearing white helmets in the downtown area—they are noted for their friendliness, hospitality, and concern for those who work, live, and visit Atlanta. The force covers two shifts per day on 16 walking beats in the 120-block Downtown Improvement District.

AUDIOTAPING

Many of the NECC 2000 Program Sessions are being recorded on audiotape and are available for sale to NECC 2000 attendees during and after the conference. Sales are located in the public space across from Room 160W (follow the signs!). In most instances, session material will be available within one hour of the session's end. An order form for tapes has been included in each registration bag and will be available on the NECC Web site following the conference. Sessions that are being taped will be denoted with a 🖭 icon.

CAFÉ CONNECT & CREATE SOMETHING

Join us at the BellSouth Foundation's Café Connect & Create Something, located beneath the escalators between the West lobby and the main registration area. This area will be available throughout the conference for attendees to check e-mail, surf the Web, plan their schedules using our online Web Conference Planner, and learn more about how the BellSouth Foundation is supporting teachers in the southeast United States.

E-MAIL STATIONS

NECC 2000 is happy to provide attendees with high-speed Internet, e-mail, and Web access from approximately 200 workstations located at the West meeting room levels. Access will be available beginning Saturday afternoon, June 24, and will continue throughout the conference. Connectivity and PC hardware is provided by Lightspan, Inc. and Gateway. Macintosh hardware is provided by Apple.

FOOD SERVICE

There are several food service options available within the GWCC and at the Omni Hotel's Food Court. Food concessions are also offered in Exhibit Halls D, E, and F. Stop by the Restaurant Information Booth in the lobby for a listing of local eateries.

HOTEL SHUTTLE SERVICE

Shuttle service, sponsored in part by Sun Microsystems Computer Corporation, will be available between official NECC 2000 conference hotels and the GWCC. Please see the shuttle schedule on page 11 for hours of operation and boarding details. All conference shuttles will arrive at and depart from the main entrance of the GWCC. Shuttle fliers are available at the NECC 2000 Info Booth and at the Shuttle Info Booth in the transportation staging area. Inquire at your hotel lobby for the pickup location and times for your particular hotel.

IMPORTANT PHONE NUMBERS

PRESS ROOM

404.222.6002
404.222.6003
404.222.6004 (FX)

HOUSING BOOTH

404.222.6007

INFORMATION BOOTH

404.222.6008

COMMITTEE HEADQUARTERS

404.222.6000
404.222.6001

LOST & FOUND

The NECC 2000 Information Booth, located in the main registration area, will maintain a Lost & Found box. Please bring all found items here, and check with the booth staff for items you may have lost or misplaced. Any unclaimed items will be shipped to the NECA Headquarters office in Oregon following the conference.

NON-SMOKING

We ask that NECC 2000 participants refrain from smoking within the conferernce facility. Your cooperation is appreciated!

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ON-SITE CONFERENCE PLANNER

The Conference Schedule Planner System, sponsored by Chancery Software, gives attendees the opportunity to use the Internet to view the conference schedule and plan their daily itinerary. Attendees can:

- see up-to-the-minute information on scheduled activities;
- query the system by time, date, topic, and presenter;
- store their itineraries on the system and revise them as needed;
- have the system identify schedule conflicts;

Access the planner through the NECC Web site (www.neccsite.org) using one of the many e-mail stations throughout the GWCC or in the BellSouth Foundation's Café Connect & Create Something.

DAILY NEWSLETTER

Be sure to pick up the NECC daily newsletter to find out about conference highlights and session changes. The newsletter is available each day at the registration counters, the keynote sessions, and the NECC 2000 Information Booth.

PRESS ROOM/LOUNGE

NECC 2000 will provide members of the national, regional, and local media with a multiactivity Press Room located in the GWCC, Room 163W. Local and long distance (using credit card) telephone service will be available, as will Ethernet and T-1 speed Internet access. The Press Room/Lounge will be open and staffed from 5–7 pm Sunday, 8 am–6 pm Monday and Tuesday, and 8 am–2 pm on Wednesday. For conference updates, a schedule of press-related events, access to equipment reserved specifically for the press, and other special requests, please show your press credentials in the Press Room.

SERVICES FOR PERSONS WITH DISABILITIES

If you require accommodations to attend or participate in NECC 2000, please ask for Jane Royall or Kim Hartsell at the NECC 2000 Information Booth. Real-time captioning and sign language interpreters will be available for each of the keynote sessions. For those sessions not captioned, interpreters participants who are deaf or hard of hearing will be provided on request. A limited number of wheelchairs and assistive listening devices will be available on request. Please note that it may not be possible to honor requests for accommodations that are made on-site.

SACK SITTERS, SHIPPING, AND STORAGE SERVICE

The Sack Sitters booth is located on the Exhibit Hall level, between Halls D and E in the connecting corridor. This service will provide:

- UPS Shipping: Next Day, Second Day, Three Day, and Ground;
- International Shipping;
- "Rent-A-Box" for session materials and exhibit goodies. A one-time fee buys overnight storage and continual accumulation for the duration of the conference;
- All packaging material purchase, including boxes, packing tape, and labels;
- A full-time Traces and Claims office to locate and resolve lost or damaged parcels;
- Sack Sitters accepts Visa, MasterCard, Amex, Diners Club, checks, and cash, and they can ship on UPS accounts.

Hours of operation are Monday, June 26, 9 am–6 pm; Tuesday, June 27, 9 am–5:30 pm; and Wednesday, June 28, 9 am–4:30 pm.

LAST-DAY LUGGAGE STORAGE

For your convenience, luggage storage services will be provided by the GWCC on Wednesday, June 28, in the On-Site Registration area, 7 am–6 pm. $1.50/bag or jacket.

NECC CD-ROM

NECC 2000 registrants receive a commemorative dual-platform CD-ROM in their registration bags. The CD contains descriptions of each workshop and conference session, as well as the conference Research Proceedings *and PDF files of the* Final Program and Exhibit Guide. *Additional copies of the CD are available at On-Site Registration and through ISTE (International Society for Technology in Education) after the conference, for $5 (www.iste.org).*

SHUTTLE SERVICE (BETWEEN CONFERENCE HOTELS AND THE GWCC/EVENING EVENTS)

Friday, June 23 .... 5–8 pm

Saturday, June 24 .... 7 am–6 pm

Sunday, June 25 .... 7 am–10:30 pm

Monday, June 26 .... 7 am–7 pm

Continuous shuttle service will be provided between conference hotels and the Atlanta Zoo event from 5–9 pm

Tuesday, June 27 .... 7 am–7 pm

Continuous shuttle service will be provided between conference hotels and the Hyatt Regency Atlanta from 6 pm–midnight.

Wednesday, June 28 .... 7 am–6 pm

CONTACT INFORMATION & SUMMARIES FOR ALL MAIN SPEAKERS IS AVAILABLE ON THE NECC CD-ROM!

(THE CD IS FREE TO ALL ATTENDEES! SEE YOUR REGISTRATION BAG.)

Unless otherwise noted, shuttles will depart from and return to the main entrance of the Georgia World Congress Center (GWCC) every 15–20 minutes (every 30 minutes Friday, June 23). This schedule is subject to revision and was accurate as of press time. Please do not forget to check the GWCC and your hotel lobbies for up-to-date frequency, dates, and changes! Though this schedule may also be affected by traffic conditions and other events taking place in the Atlanta downtown area, every effort is being made to ensure that your transportation service is timely, comfortable, and consistent. Please let our service providers, Atlanta Arrangements, know if your experience is otherwise.

Schedules are available at the transportation desk near the entrance to the west concourse and at the NECC 2000 Information Desk in the On-Site Registration area.

NECC 2000 transportation service is sponsored in part by Sun Microsystems Computer Corporation.

NECC 2000 HOTELS

Hyatt Regency Atlanta (HQ)	**265 Peachtree Street, NE**	**404.577.1234**
Atlanta Marriott Marquis	265 Peachtree Center Boulevard	404.521.0000
Courtyard by Marriott Downtown Atlanta	175 Piedmont Avenue, NE	404.659.2727
Days Inn Atlanta	300 Spring Street	404.523.1144
Embassy Suites	267 Marietta Street	404.223.2300
Fairfield Inn Downtown Atlanta	175 Piedmont Avenue, NE	404.659.7777
The Georgian Terrace (Midtown)	659 Peachtree Street	404.897.1991
Hampton Inn and Suites Atlanta Downtown	161 Spring Street	404.589.1111
Hilton Atlanta and Towers	255 Courtland Street, NE	404.659.2000
Holiday Inn Downtown Atlanta	101 International Boulevard	404.524.5555
Holiday Inn Midtown North	1810 Howell Mill Road	404.351.3831
Omni Hotel at CNN	100 CNN Center	404.659.0000
Ramada Hotel Downtown	70 John Wesley Dobbs Avenue, NE	404.659.2660
Ramada Inn & Conference Center (Midtown)	418 Armour Drive, NE	404.873.4661
Renaissance Atlanta Hotel Downtown	590 West Peachtree Street	404.881.6000
Ritz Carlton Atlanta Hotel	181 Peachtree Street, NE	404.659.0400
Sheraton (Downtown)	165 Courtland Street	404.659.6500
Suite Hotel Underground	54 Peachtree Street	404.223.5555
Westin Peachtree Plaza	210 Peachtree Street, NW	404.659.1400
Wyndham Atlanta Hotel	160 Spring Street	404.688.8600

MORE HOTELS MAY HAVE BEEN ADDED AFTER PRESS TIME OF THIS PROGRAM. PLEASE CHECK WITH THE HOUSING DESK IN THE ON-SITE REGISTRATION AREA FOR MAPS, ADDITIONAL ADDRESSES, AND PHONE NUMBERS.

NECC 2000 TOURS

There is a lot to enjoy in Atlanta…from major league baseball to hikes to the Atlanta Zoo, to a number of historical and cultural landmarks. Atlanta and its surrounding region offer a unique variety of opportunities to make your visit memorable. Please join us on these specially selected treks that highlight Atlanta's many attractions and destinations. Tours require prepayment and advance reservations. Tickets for tours that still have space available may be purchased at On-Site Registration in the GWCC. Tour guides, with signs for each tour, will meet participants inside the west entrance to the GWCC 15 minutes prior to departure.

DAY	NAME	TOUR TIME	BUS BOARDING
Saturday, June 24	A Taste of the Peach	9 am–1 pm	8:45 am
	Spectacular Stone Mountain Park	6 pm–12 am	5:45 pm
Sunday, June 25	Covington's Mansions & Magnolias	9 am–3 pm	8:45 am
	Atlanta's Famous Firsts	1 pm–5 pm	12:45 pm
	Georgia's Stone Mountain	1 pm–5 pm	12:45 pm
Tuesday, June 27	Atlanta's Famous Firsts	1 pm–5 pm	12:45 pm
Wednesday, June 28	A Taste of the Peach	9 am–1 pm	8:45 am

TAKE YOURSELF OUT TO THE BALL GAME!

Atlanta Braves versus Milwaukee Brewers
Saturday, June 24, 7:10 pm, Turner Field

Those who have purchased tickets for Saturday night's Braves/Brewers game need to exchange the badge ticket received with their NECC 2000 registration for a stadium ticket at the Event & Workshop Tickets Counter at On-Site Registration during regular registration hours Friday, June 23, and Saturday, June 24. Some tickets will be available at On-Site Registration—please check. Transportation to and from Turner Field is not provided, but you can get directions at www.atlantabraves.com/braves_tf_directions/0,1640,13,00.html.

A seating chart for the stadium is available at www.atlantabraves.com/braves_schedule/0,1629,0,00.html.

NECC 2000 KIDS' AEROSPACE CAMP AT GEORGIA TECH

- Monday, June 26, $50
- Tuesday, June 27, $50
- Wednesday, June 28, $65

Fees include all materials and supplies, daily lunches, transportation, T-shirt, admission fees to Museum of Aviation (all days), and transportation to and from the Museum of Aviation in Warner Robins, GA (Wednesday only).

This three-day supervised science program for youth entering Grades 4–8 will take place on the Georgia Tech campus, 8 am–4 pm, June 26–28. Participants will explore flight and space by completing fun hands-on aviation/aerospace activities including construction of kites, hot-air balloons, gliders, rockets, and much more. Campers will receive free posters and software. A trip to the Museum of Aviation in Warner Robins, Georgia, is included on the third day.

Attendees may attend one, two, or three days of the program. Buses for the Kids' Camp will depart each day at 8 am and will drop students off in the bus loading/unloading area in front of the Georgia Dome each afternoon at 4 pm. Chaperones will stay with students until they have been picked up by their parents or legal guardians.

MORNING WORKSHOPS

8:30–11:30 am

AFTERNOON WORKSHOPS

1:30–4:30 pm

FULL-DAY WORKSHOPS

9 am–4 pm

Georgia Showcase Workshops feature local presenters and/or topics of specific interest to Georgia teachers, administrators, technology coordinators, and specialists.

NECC 2000 Workshops are organized and operated by ISTE (International Society for Technology in Education). More information about how ISTE connects educators worldwide to dependable resources can be found on the ISTE Web site at www.iste.org.

WORKSHOP TRANSPORTATION

Transportation is provided to all off-site workshops. Buses will board in front of the Georgia Dome just west of the GWCC main entrance. Please check below for your workshop's exact bus loading and departure times.

IMPORTANT! Some buses depart as early as one hour prior to workshop start time, so you are advised to plan accordingly. ***Transportation will not be provided for participants who miss their buses.***

OFF-SITE WORKSHOP BUS SCHEDULE

Location	*Morning* Load/Depart	*Full-Day* Load/Depart	*Afternoon* Load/Depart
CEISMC	7:50 am/8 am	8:20 am/8:30 am	12:20 pm/12:30 pm
Clayton	7:20 am/7:30 am	7:50 am/8 am	11:50 am/12 noon
F3 Lab	7:50 am/8 am	8:20 am/8:30 am	12:20 pm/12:30 pm
GSU	7:20 am/7:30 am*	7:50 am/8 am*	12:20 pm/12:30 pm*
Lovett	7:35 am/7:45 am	8:05 am/8:15 am	12:05 pm/12:15 pm
Pace	7:35 am/7:45 am	8:05 am/8:15 am	12:05 pm/12:15 pm
Logosium (SUF249) @ UGA		7:50 am/8 am	N/A

** Continuous shuttles between the GWCC and GSU starts at 7:30 am and runs until 4:30 pm; every 15–20 minutes.*

WORKSHOP LOCATION ABBREVIATIONS

Clayton	Clayton County Schools North Jonesboro Training Center
F3 Lab	Foundations for the Future Forum
CEISMC Lab	Georgia Institute of Technology's Center for Education Integrating Science, Mathematics and Computing
GWCC	Georgia World Congress Center
GSU	Georgia State University A&H = Arts and Humanities Building COE = College of Education CS = Classroom South Building
Lovett	The Lovett School
Pace	Pace Academy
UGA	University of Georgia–Athens

SATURDAY MORNING

SAA100
Tips and Strategies for Enhancing Student and Teacher Multimedia Presentations
Lynell Burmark, Lou Fournier
Seminar/Demo GWCC, Room 256W

SAA101
DVD Technology: Practical Applications for Every Classroom
Ann Cunningham, Sandra Benedetto, Karen Butler
(Exhibitor-sponsored workshop)
Seminar/Demo GWCC, Room 264W

SAA102
Putting Total Cost of Ownership to Work
Sara Fitzgerald, Betty VanDam, Marla Davenport
(Sponsored by the Consortium for School Networking [CoSN])
Seminar/Demo GWCC, Room 254W

SAA103
Assessing Technology
Tricia Howell, Gale Hulme, Katie Lovett, Georgia Barnwell, Sandy Ewanowski, Mary Mason, Sandi Glass
Seminar/Demo GWCC, Room 255W

SAA104
Five Hundred Miles—Teaching Persistence, Developing Expertise
Jamie McKenzie
Hands-On GWCC, Room 265W

SAA105
The School Odyssey: Using Digital Portfolios for Assessment and Accountability
David Niguidula, Hilarie Davis
Hands-On GSU, CS305

SATURDAY AFTERNOON

SAP112
Electronic Portfolios = Multimedia Skills + Portfolio Development
Helen Barrett
Seminar/Demo GWCC, Room 264W

SAP113
Reaching Every Learner: Using Multimedia and Multiple Intelligences
Lynell Burmark, Lou Fournier
Seminar/Demo GWCC, Room 256W

SAP114
Beyond HTML: Web Site Design
Chris Clark
Hands-On GSU, COE Open

SAP115
Teaching with the Internet
Sheila Gersh
Hands-On GSU, CS305

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SAP117
Imaging and Imagination: Visual Tools in the K-12 Classroom
Larry Johnson, Annette Lamb
Seminar/Demo GWCC, Room 254W

SAP118
PK-2? What's Out There for You?
Gail Lovely
Seminar/Demo GWCC, Room 255W

SAP119
Module Maker—Web-Based Learning and Online Research Modules
Jamie McKenzie
Hands-On GWCC, Room 265W

SAP120
Responsible Use of the Internet in Schools: Legal and Ethical Issues
Nancy Willard
Seminar/Demo GWCC, Room 257W

SATURDAY FULL-DAY

SAF124
Go Anywhere Multimedia: Digital Cameras in the Classroom
Molly Carbo, Mark Delano, Nori Murphy, Greg Peck
Hands-On Clayton, Room 14

SAF125
Technology Grantseekers' Toolkit for the New Millennium
Gary Carnow
Seminar/Demo GWCC, Room 260W

SAF128
Integrating Technology into the K-12 Classroom through Interactive Projects
Edna Gentry, Donna Cauley, Jane Jones
Hands-On GSU, CS401

SAF129
In 3, in 2, in 1 ... We're Live!
Virginia Jewell
Hands-On GWCC, Room 262W

SAF130
Online Learning for Teachers and Students
Kirsten Johnson, Barbara Treacy, Susie Metrick
Hands-On GSU, CS403

SAF133
Why Did the Robot Cross the Road? Come Find Out!
Steve Lindaas, Alison Wallace, Mary Beth Kelley-Lowe, Terry Feltis
Hands-On Pace, Lab 2

SAF134
Query Power: Using Microsoft® Access in a Constructivist Classroom
John McGowan
Hands-On GWCC, Room 263W

SAF135
Helping Your Students Create Projects with Microsoft® Office and the Web
Tina Mondale
Hands-On GSU, COE100

SAF139
Is It Working? Designing a Technology Evaluation and Assessment Plan
Jeff Sun
Hands-On Pace, Lab 1

SAF140
Teachers Creating Classroom Web Pages
Jeff Tharpe
Hands-On GSU, COE252

SAF141
Putting It All Together: Technology, Teaching, Lessons and Learning
Lois Thornberg
Hands-On Clayton, Room 4

SAF142
WebCT: The Complete Introductory Training Session
Anna Hillman, David Wells
Hands-On GSU, COE130

SAF143
Standards-Based, Student-Centered, Scalable Professional Development
Art Wolinsky, Tom March
Hands-On GSU, COE106

SAF146
ThinkQuest®: The Coaches' Workshop
Robert Sibley, David Warlick, Nancy Velez
(Sponsored by ISTE's Organization Affiliate Executive Board)
Seminar/Demo GWCC, Room 261W

SUNDAY MORNING

SUA200
Using Multimedia to Enhance Learning and Motivate Students
Salvatore Angelica
Hands-On GSU, CS403

SUA202
American Memory Digital Primary Resources: Connect the Past, Present, and Future
Leni Donlan
(Sponsored by the National Council for the Social Studies [NCSS])
Hands-On GSU, COE130

SUA203
You Need a Little Inspiration® to Solve Your Problems!
Leslie Flanders
Hands-On Pace, Lab 1

SUA204
Staff Development for the Integration of Technology into Instructional Strategies
Terri Jenkins, Lynn Baber
Seminar/Demo GWCC, Room 256W

SUA205
WebQuests: Taming the Wild, Wild Web
Pamela Kuck
Seminar/Demo GWCC, Room 269W

SUA206
PowerLearning—Creating Student-Centered, Problem-Based Classrooms
Jamie McKenzie
Hands-On GWCC, Room 265W

SUA207
PowerLearn:
Best Practice and New Trends in Technology Staff Development
Len Scrogan
Seminar/Demo GWCC, Room 362W

SUA208
Make It with Microsoft® Office
Vicki Sharp, Richard Sharp
Hands-On GSU, COE246

SUA209
Building Videoconferencing Activities for the K-12 Classroom
Stan Silverman, Gene Silverman, Fred Podowski, Paula Pisano, Nancy Schempp
Seminar/Demo GWCC, Room 264W

SUA210
Creating Successful Proposals for Educational-Technology Projects
Jeff Sun, Heather Hurley
Seminar/Demo GWCC, Room 255W

SUA211
Understanding Digital Images
Sharon Yoder, Irene Smith
Seminar/Demo GWCC, Room 260W

SUNDAY AFTERNOON

SUP215
Weaving It All Together:
A Professional Development Tapestry
Jackie Burniske, Joan Gil, Vicki Dimock
Seminar/Demo GWCC, Room 269W

SUP216
Gearing Up for Online Projects
Marla Davenport, Rachel Brown, Lyne Motylinski
Hands-On GSU, COE246

SUP218
PowerLearning—Creating Student-Centered, Problem-Based Classrooms
Jamie McKenzie
Hands-On GWCC, Room 265W

SUP219
Student Leadership, Technology, and Empowerment: A Program That Works
Rae Niles, Jayne James
Hands-On GSU, COE130

SUP221
Communicate, Collaborate, and Celebrate: Reaping the Benefits of the Internet
Ladd Skelly
(Exhibitor-sponsored workshop)
Hands-On GSU, CS403

SUP222
Music In Education™: The First Music Classroom Network for Instruction
Michael Skinner, Shelby Fullerton
(Exhibitor-sponsored workshop)
Seminar/Demo GWCC, Room 255W

SUP223
Animation with the HyperAnimaniacs
Kate Vanderhorst, Rod Rychliski
Hands-On Pace, Lab 1

SUP224
Framing the Grant:
Teaching, Not Technology
Paola Williams, Watts Margit
(Sponsored by ISTE's HyperSIG)
Seminar/Demo GWCC, Room 256W

SUNDAY FULL-DAY

SUF225
Create Your Own Electronic Teaching Portfolio
Helen Barrett
Hands-On Clayton, Room 4

SUF226
Technology Coordinators:
Coping, Thriving, Sharing
Willis Binnard
(Sponsored by ISTE's SIGTC)
Seminar/Demo GWCC, Room 254W

SUF228
Bytes, Camera, Action, MovieWorks!
Corinne Carriero, Ellen Robertson
Hands-On GWCC, Room 262W

SUF229
Creating Web-Based Courses with WebCT
Chris Clark
(Sponsored by ISTE's SIG/Tel)
Hands-On GSU, CS305

SUF231
Every Child Can Learn to Read with Technology
Tricia Cooling, Stacey Bennett
Hands-On GSU, COE106

SUF233
Creating Web-Based Lessons: WebQuests and Other Internet Projects
Miguel Guhlin, Jim Baldoni
Hands-On GSU, COE116

SUF234
Planning for Success—Developing Effective Strategic Long-Range Plans
Ian Jukes, Ted McCain
Seminar/Demo GWCC, Room 257W

SUF236
New and Emerging Competencies for Building-Level Technology Champions (formerly Improving Teaching and Learning through Technology at the Campus Level)
Keith Krueger
(Sponsored by the Consortium for School Networking [COSN] with support from BellSouth)
Seminar/Demo GWCC, Room 267W

SUF237
Creating Database-Backed Web Sites with FrontPage® 2000
Todd McIntire
Hands-On GSU, COE100

SUF238
Virtual Reality in and out of the Classroom
Jim McKeown, Roger Reed
Seminar/Demo GWCC, Room 268W

SUF239
Beginning Photoshop®
Bonnie Meltzer
Hands-On GSU, A&H211

SUF240
The Classroom and Beyond: Integrating Handheld PCs and Digital Cameras
Gregory Peck, Mark Delano, Molly Carbo, Nori Murphy
Hands-On Clayton, Room 14

SUF243
Staff Development and the Web: Making It Work for Teachers
Neal Strudler, Marianne Handler
(Sponsored by ISTE's SIGTE)
Hands-On GWCC, Room 263W

SUF244
Going Bananas over Dreamweaver®
Manorama Talaiver
Hands-On GSU, COE Open

SUF245
The Digital Camera in the Classroom
Andy Ventress
Hands-On F3 Lab

SUF247
ClassWebs: Cultivating the Internet for Learning
David Warlick
Hands-On GSU, COE252

SUF248
Professional Development Planning: Can You Succeed without It?
Cynthia Dunlap, Anne Knight
Seminar/Demo GWCC, Room 261W

SUNDAY
8:30 AM–7 PM

SUF249
Logosium 2000 Full-Day Conference and Social Dinner
Gary Stager
(Sponsored by ISTE's SIGLogo)
Hands-On UGA

MONDAY MORNING

◆ **MA301**
Are You Connected? Everyday Internet Use
Sheila Barnes, Lynne Purcell, Lisa Ciardulli
Hands-On GSU, COE106

MA302
SCR*TEC's Profiler: Supporting Collaboration and Targeting Staff Development Needs
Christina Blauer
Hands-On GWCC, Room 262W

MA303
Using the InTech Model in the Student-Centered Classroom
Melody Bonnette, Sandy Swartz
Hands-On GSU, COE100

MA304
Web Tools
Laren Brooks, Lynnette Morrison
Hands-On GSU, CS305

MA305
Use AppleWorks® with Elementary Kids
Janet Caughlin, Connie Baxter
Hands-On Pace, Lab 2

MA308
3-D Graphics Kids Love!
Robert Frazier
Hands-On Clayton, Room 4

MA309
Connecting Multiple Intelligences and Technology
Jeannie Heacock
Hands-On Lovett, Lab C

◆ **MA310**
From Digital to Analog: Videotaping Your PowerPoint® Presentations
Crill Head, Glenda Miller
Hands-On GSU, COE252

MA311
Technology-Assisted Project-Based Learning
Anthony Jongejan, Kathy Buchanan
Hands-On Clayton, Room 14

MA312
Using Clay Animation in Your Classroom!
Melinda Kolk, Nancy Smith, Mark Benno
(Exhibitor-sponsored workshop)
Hands-On GWCC, Room 265W

MA313
Create and Manage Your Web Site Using Net Objects Fusion® 5.0
Keith Mack, Karen Mack
Hands-On GWCC, Room 263W

MA314
Technology as a Tool for the Elementary Social Studies Classroom
LaRay Mason, Paulette Williams, Laurie Surles, Michael Berson, Sue McGinniss
(Sponsored by the National Council for the Social Studies [NCSS])
Hands-On GSU, COE Open

◆ **MA316**
PowerPoint®: Bringing Method to the Madness
Phyllis Snipes
Hands-On GSU, COE116

MA318
Narrowing the Internet: Create a Web Page Directing Student Learning
Maria Narciso, Paul Tarantiles
Hands-On Lovett, Lab D

MA321
Learn How to Host a Collaborative Internet Project
Susan Silverman
Hands-On GSU, CS403

MA347
Beginning Internet
John Richardson
Hands-On GSU, A&H211

MONDAY AFTERNOON

MP324
SCR*TEC Presents: Using Free Tools to Create and Assess Web-Based Lessons
Douglas Adams, Jim Gardner, Christy Blauer
Hands-On GWCC, Room 263W

MP325
Acrobat® 4.0 Boot Camp for Education
Steve Adler
Hands-On Pace, Lab 1

MP327
From Information to Knowledge: Using Geographic Information Systems in Schools
Kristen Bjork, Patricia Wang-Iverson, Elizabeth Bjork
Hands-On GSU, COE106

MP328
Technology in the Multidisciplinary Classroom—How Does It Work?
Linda Bloom
(Exhibitor-sponsored workshop)
Hands-On GSU, COE100

MP329
MarcoPolo: Internet Content Staff Development Resources
Todd Brekhus
(Exhibitor-sponsored workshop)
Hands-On GSU, COE246

MP330
Bring Learning to Life—Integrating Multimedia Sounds and Music into Student Projects
Greg Butler, Kelly Starr
Hands-On GSU, COE130

MP331
The Image Connection: Communicating Effectively with Instant and Digital Images
Tom Crockett
(Exhibitor-sponsored workshop)
Hands-On GSU, CS403

MP332
What Can You Do with a Graphing Calculator?
Ben Davis, Jimmy Bostock
Hands-On GSU, COE252

MP333
The Fourth Dimension—Animating 3-D Worlds
Robert Frazier
Hands-On Clayton, Room 4

MP334
A Quest for the Crossroads: WebQuests, Thinking Skills, and Technology
Jeannie Heacock
Hands-On Lovett, Lab C

MP335
Research, Replication, Results: Integrating Technology from Georgia to Louisiana Classrooms
Adrianne Hunt, Joana Dieterich, Sheila Talamo, Linda Whitacre
Hands-On GSU, COE116

MP336
Bring Visual Learning into the Classroom with Inspiration®
Robin Christensen, Susan Krug
(Exhibitor-sponsored workshop)
Hands-On F3 Lab

MP337
Snatching Moments: Connecting with the Curriculum Integration Specialist Within
Christy Johnston
(Exhibitor-sponsored workshop)
Hands-On GSU, CS401

MP339
Setting Up and Maintaining a Web Server for the Novice
Bradley Moore
Hands-On GSU, COE Open

MP340
Pagemaker® 6.5: A Recipe for Success
Rae Niles
Hands-On GSU, A&H211

MP341
A Principals' and Administrators' Guide to Leading and Evaluating Effective Technology Integration
Debra Rein
(Exhibitor-sponsored workshop)
Hands-On GWCC, Room 262W

MP342
Kids, Curriculum, and Technology: Putting It All Together
Linda Reynolds, Mike Barney
Hands-On Lovett, Lab D

MP343
Social Studies Inquiry through WebQuests: A Hands-on Opportunity for Exploration and Construction
Gail Ring, George Lipscomb, Stephanie Van Hover
(Sponsored by the National Council for the Social Studies [NCSS])
Hands-On GSU, CS305

MP344
Harnessing the Power of Streaming Video
Samuel Shiffman
Hands-On GWCC, Room 265W

MP346
Technology and the Curriculum: Creating a Virtual Resource Center
Carol Whelan, Alita Robertson, Margaret Curette, Hailey Davidson, Rachel Sellers
Hands-On CEISMC Lab

TUESDAY MORNING

TA400
Creating a Digital Portfolio
Arnie Abrams
Hands-On GSU, COE Open

TA402
Interactive, Dynamic Educational Web Sites
Teresa Bromley, Jo Lynn Allen, Linda Babb, Paula Duncan, Judy Parham
Hands-On GWCC, Room 265W

TA403
Moving beyond Multimedia Basics with Kid Pix®
Beverly Burks, Roberta Marshall, Regina Woods, Catherine Ritter
Hands-On GSU, A&H211

TA404
Successful Curriculum Integration Strategies Based around Application Software
Greg Butler, Kelly Starr
Hands-On GSU, COE130

TA405
Use AppleWorks® with Middle- and High-School Kids
Janet Caughlin
Hands-On Pace, Lab 2

TA407
Integrating Technology Successfully into K-12 Curriculum
Don Henderson, Sheila Herd, Jack Podell
(Exhibitor-sponsored workshop)
Hands-On GWCC, Room 262W

TA409
Typography: Artistry with Words
Carol Kelly, Davis Brock
Hands-On GSU, COE106

TA410
Classroom Campfires: Don't Internet, Integrate!
Annette Lamb, Larry Johnson
Hands-On GSU, COE100

TA412
Applying NASA Research to Project-Based and Problem-Based Curricula for Grades 4-12
Robert Myers, Laurie Ruberg
Hands-On F3 Lab

◆ **TA413**
Create a WebCT Course!
Karen Oates
Hands-On GSU, CS403

TA414
LEGO® MINDSTORMS™: Inexpensive, Easy Classroom Robotics
Timothy Phillips, Michael Phillips
Hands-On GSU, COE252

◆ **TA415**
Internet-Enriched Language Arts
Lynne Purcell
Hands-On GSU, COE246

TA416
Meeting at the Crossroads: Enhancing Cross-Curricular Projects with Technology
Serena Roberts, Erin Thaler
Hands-On GSU, CS305

TA418
SCR*TEC Presents: Creating Web-Capable Databases Using FileMaker™ Pro
Allen Steckelberg, Douglas Adams, Christy Blauer, Jim Nazworthy
Hands-On GWCC, Room 263W

TA419
Scanners and Their Applications
Thomas Toleston, Mary Jo Toleston
Hands-On GSU, COE116

TA421
Internet Project-Based Learning for the Classroom Teacher
B. Jean Weller, Kate Santhuff
Hands-On CEISMC Lab

TA422
The Network Is the School
Jim Woodell
Hands-On GSU, CS401

TUESDAY AFTERNOON

TP424
Help Students Learn from One Another: Collaborative Learning Tools in Action
Michelle Baker, Marge Cappo, Judith Levy Cohen
(Exhibitor-sponsored workshop)
Hands-On Lovett, Lab D

TP426
A Wild Ride: Technology Integration with Middle-School Classrooms@work
Hands-On GSU, COE100

TP427
Electronic Portfolios for Teachers and Students: An Introduction to Electronic Portfolios for Teachers and Students
Nancy Becker, Bobbie Welch
Hands-On GSU, COE Open

TP429
Software Evaluation 101
Warren Buckleitner
Hands-On GSU, COE130

TUESDAY AFTERNOON, CONT.

TP430
Piecing Together the Engaged Learning Puzzle
Constance Cassity, Louanne Smolin
Hands-On GWCC, Room 263W

TP431
Problem-Based Learning: Drawing from the Web Well
Hilarie Davis, Robert Myers
Hands-On GWCC, Room 265W

TP432
Getting your Database Online with FileMaker™ 5.0
Leslie Fisher
Hands-On Pace, Lab 2

TP433
Tap in to Online Professional Development
Judi Fusco, Patti Schank, Mark Schlager, Hunter Gehlbach
Hands-On Pace, Lab 1

TP434
Technology Tools for Administrators
Eileen Gallagher, Yvette Chisom
Hands-On GSU, COE116

TP435
Weave Your Own Web Site
Wendy Marshall
Hands-On GSU, COE106

TP436
Teaching with Primary Sources
Donna Miller
Hands-On GSU, COE252

TP437
Travel USA: Technology Integration with Elementary Classrooms@work
Amy Pearl
Hands-On GSU, COE246

TP439
Standards-Based Teaching and Assessment Strategies
Francesca Venning
(Exhibitor-sponsored workshop)
Hands-On GWCC, Room 262W

TP441
Creating Virtual Tours with QuickTime™ Virtual Reality
Denaya Wininger, Michael Wininger
Hands-On GSU, A&H211

WEDNESDAY MORNING

WA500
Web Publishing for Teachers
Darlene Andre, Bruce Ahlborn
Hands-On Pace, Lab 1

WA501
Global Challenge: Technology Integration with High School Classrooms@work
Anne Batey, Amy Pearl
Hands-On GWCC, Room 265W

WA502
Transforming Schools through Technology Integration
Kristin Ciesemier, Seymour Hanfling, Jim Nazworthy, Bruce Hoffacker, Raynette Sanchez, Elizabeth Byrom
Hands-On GWCC, Room 263W

WA503
Creating Web Graphics Using Adobe® Photoshop® 5.5
Leslie Fisher
Hands-On Pace, Lab 2

WA504
Creating Electronic Stories
Sheri Herod, Diane Allen, DeNeene Henderson, Barbara Sanders
Hands-On GSU, A&H 211

WA507
Innovative Strategies to Enhance Learning with Mobile Technologies
Francesca Venning
(Exhibitor-sponsored workshop)
Hands-On GWCC, Room 262W

DON'T FORGET TO FILL OUT YOUR CONFERENCE EVALUATION! A FORM IS INCLUDED IN EACH CONFERENCE REGISTRATION TOTE BAG. COMPLETE YOUR EVALUATION AND RETURN IT TO THE NECC 2001 BOOTH!

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MAKE & TAKE SESSIONS

NEW!

MAKE & TAKE sessions are two hours long and have a hands-on component that results in participants leaving with a product such as a WebQuest, Web page, big book, or electronic presentation. The format is collaborative groups of three to a computer, except for the "Geographic Information Systems (GIS) for Educators" Make & Take Sessions, in which each participant has a laptop.

Make & Take sessions require preregistration and payment of a $10 fee. Check On-Site Registration for availability of these sessions.

MONDAY MORNING

10 AM–12 NOON

MTM001
K-12 Videoconferencing for Teaching and Learning: Planning and Implementation
Kirk deFord

MTM002
Wanted:
A Cross-Curricular Activity
Becky Firth

MTM003
Electronic Me-Books: Helping Students Develop Language Skills
Timothy Green, Jody Peerless

MTM004
Musical Crossroads:
The Rhythm of Technology
Jeanne Muñoz

MONDAY AFTERNOON

1:30–3:30 PM

MTM005
Take a Byte out of the Internet-Feeding Classrooms
Betty Higdon

MTM006
The Internet and the Primary Student
Emmett Mullins

MTM007
Create Web Graphics like the Professionals
Carol Siwinski

MTM008
Making Your Teaching Portfolio a Teaching Tool:
A Web-Based Approach
Hong (Carol) Yin Sun

MTM009
Geographic Information Systems (GIS) for Educators
John Kuglin, Chris Kuglin, Lauren Mackay

TUESDAY MORNING

10 AM–12 NOON

MTT010
WWW.Creating Curriculum Web Pages with FrontPage Express
Sandy Beck, Kathy Adkins, Linda Spudic

MTT011
Supporting Problem-Based Learning Activities with Freeware
Mary Burns, Victoria Dimock

MTT012
Mouse or No Mouse
Tammy Donalson

MTT013
Tackling Technology Integration: No Athletic Gear Required
Carmen Gonzales, Susan Bussmann, Kathrine Martinez Graham, Susan Smith

MTT014
Geographic Information Systems (GIS) for Educators
John Kuglin, Chris Kuglin, Lauren Mackay

TUESDAY AFTERNOON

1:30–3:30 PM

MTT015
Virtual Reality for Real Learning
Mark Christal, Nancy Allen

MTT016
Playing with Matches: Teaching to Standards without Getting Burned
Terrie Gray, Brian Bridges, Mike Menchaka

MTT017
Create a Scavenger Hunt Web Site
Kathy Lincoln

MTT018
The Internet Book Club for K-12 Collaboration
Bonnie Thurber, Bob Davis, Tamara McCulloch

MTT019
Geographic Information Systems (GIS) for Educators
John Kuglin, Chris Kuglin, Lauren Mackay

WEDNESDAY MORNING

10 AM–12 NOON

MTW020
Online Course Creation: Accessing Innovative Digitized Multimedia Resources
Lyn Swett Miller, Bert Ross, Ann Rose

MTW021
Nothin' on the Net: Pointing Students to Research Sources
Vickie Seavers, Nancy Nielson

MTW022
Geographic Information Systems (GIS) for Educators
John Kuglin, Chris Kuglin, Lauren Mackay

PARTICIPANTS WILL GET A ZIP DISK TO TAKE HOME THEIR CLASS PROJECTS!

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WELCOME TO THE NECC 2000 PROGRAM!

NECA and the NECC 2000 Committee extend a special thanks to our speakers. Their willingness to take the time to prepare sessions and workshops and share their expertise means we can present an excellent program that covers the breadth and depth of the use of technology in education.

MONDAY

Concurrent Sessions 1: 11 am–12 noon
Concurrent Sessions 2: 12:30–1:30 pm
Concurrent Sessions 3: 2–3 pm
Concurrent Sessions 4: 3:30–4:30 pm

TUESDAY

Concurrent Sessions 5: 10:30–11:30 am
Concurrent Sessions 6: 12 noon–1 pm
Concurrent Sessions 7: 1:30–2:30 pm
Concurrent Sessions 8: 3–4 pm
Concurrent Sessions 9: 4:30–5:30 pm

WEDNESDAY

Concurrent Sessions 10: 10:30–11:30 am
Concurrent Sessions 11: 12 noon–1 pm
Concurrent Sessions 12: 1:30–2:30 pm
Concurrent Sessions 13: 3–4 pm

SESSION TYPES/THEMES

All sessions take place at the Georgia World Congress Center (GWCC).

General Sessions are identified under the following themes and strands:

- **Beyond the Crossroads, Where Do We Go from Here**
- **Distance Learning**
- **Connecting Technology to Teaching & Learning**
  - Instructional Strategies, Technology Integration, and Management of Technology in the Classroom
  - Project-Based Learning, Information, and Visual Literacy
  - Facilitating Learning in Teams
  - Assessing Student Learning and Connecting to Standards and Assessment
  - Laptops
  - Preschool and Elementary
  - Language Arts and Social Studies
  - Math and Science
  - Computer Science
  - Other Subject Areas
  - Special Needs and Assistive Technology
  - Internet/Web
  - Multimedia
  - Support and Maintenance
  - Funding, Planning, and Implementation
  - Evaluation
  - Research
- **Staying Connected with Professional Development**
  - Staff Development
  - Preservice and Graduate Teacher Education
- **Standards, Assessment, and Accountability: Staying Connected**
- **Moving beyond the Crossroads: Teachers as Agents of Change**
- **Connected Communities: Schools, Businesses, and Resources**
  - Social, Ethical, and Policy Issues

GENERAL SESSIONS are one hour long and may be presented by an educational practitioner(s) or by a NECC 2000 Exhibitor. Exhibitor presentations are an integral part of our conference program and are solicited and juried through our standard proposal recruitment process. NECA member societies sponsor sessions from their areas of expertise with admission open to all conference attendees.
Note: Following each session description, Grade Level is listed followed by Audience. Note that "coordinators" includes administrators, library/media specialists, staff developers, and curriculum specialists.

SPOTLIGHT SESSIONS are one hour long and are led by leaders in the field of educational technology. They are featured during each of the 13 concurrent session blocks.

PAPERS are original peer-juried research papers on the general theme of using technologies to enhance education. Two papers are presented in each general session time slot.

POSTERS are informal sessions that allow participants to engage in one-on-one or small-group discussions. Visuals may be in the form of "hard" media such as poster board or bulletin board displays, or they may be electronic. Poster sessions are located in room 367W in the GWCC.

INTERNET POSTERS have the enhancement of Internet connectivity. They are located in room 367W in the GWCC.

STUDENT SHOWCASE features students and teachers demonstrating projects that use technology to promote learning and student achievement. Student Showcase presentations are located on Level 2 of the GWCC, opposite room 265W.

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MONDAY, 8:30–9:45 AM

KEYNOTE

The Technology Puzzle: Understanding and Connecting the Pieces

John Kuglin, University of Montana–Missoula

As classrooms transition into the new millennium, technology is a critical tool for schools. However, new developments are occurring at breakneck speeds. Educators find themselves staring into the box of a 5000-piece technology puzzle. In this presentation, Kuglin will demonstrate the availability of the puzzle pieces and demystify the process for connecting them in a manner that leaves participants feeling comfortable. Kuglin will highlight current and emerging Internet, video, computer, and satellite technologies with suggestions for implementing these tools in a cohesive manner.

MONDAY, 10 AM–12 NOON

STUDENT SHOWCASE

Located on Level 2, opposite Room 265W.

Use Technology to Raise Student Test Scores in Reading, Language Arts, and Math

Carolyn Huff (CA), with students Cynthia Kuhlman, Annie Neely, Darryl Felker

Students from the Atlanta Public Schools will demonstrate how their district has incorporated a comprehensive technology-based curriculum resulting in dramatically higher student test scores in reading, language arts, and math.

K–12; Teachers, Coordinators

How to Create an Effective, Student-Run Technology Help Desk

Matthew Byars, East Jessamine Middle School, Jessamine County Schools (KY), with students Kieryanne Sloan, Amanda Higginbotham, Kim Burge, Jessica King, Beau Murphy, Charles Young

The cure for your technology woes is right under your nose: your students! Learn how to create an effective, student-run help desk in your school or district.

General, K–12, Community College, University/College; Teachers, Coordinators, Postsecondary Educators

POSTERS

All posters take place in Room 367W.

The Technology Leadership Institute: It's More than a Purple Shirt

Jim Dillmann (KY), Doug Reed (KY), Carolyn Rude-Parkins (KY), Steve Brown (KY)

PS-M01-10, Table 3

Learn how Jefferson County Public Schools and the University of Louisville are collaborating to offer a master's program for experienced teachers focused on instructional technology leadership.

General; Teachers, Coordinators, Postsecondary Educators

National Pet Census: A Collaborative Web-Based Project

Paula Don (PA)

PS-M02-10, Table 1

Participating schools are counting pets! Data, ideas, and information resulting from the data collection experience are shared. Activities and links are included on the site.

Creating Preferred Futures- An Online Course in Futures Thinking

Seth Itzkan (MA), Sandy Burchsted (TX)

PS-M04-10, Table 12

The future is our only destination! Creating Preferred Futures links classes from around the globe in an interactive futures education curriculum. Explore scenarios, trends, and community involvement.

General, K–12; Teachers

Implementing the National Technology Goals 2000 into Classroom Instruction

Doris Johnson (OH)

PS-M05-10, Table 7

Get an overview of constructivism and technology usage in classrooms. Explore how computers, assistive technologies, and the Internet facilitate instruction.

General, K–12, Community College, University/College; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

The Turtle School of Dance: Using MicroWorlds® to Meet State Mathematics Curriculum Standards

Michael Lipinski (MA), Kathleen Bridgewater (MA)

PS-M06-10, Table 9

Our Turtle School of Dance project demonstrates how creative use of MicroWorlds can help teachers create exceptional elementary geometry lessons that meet state mathematics goals.

4–8; Teachers, Teacher Educators, Coordinators

Cross-Curricular Units Develop Student Learning

Craig Manley (NE), Glen Eberspecher (NE), Neal Topp (NE)

PS-M07-10, Table 4

See cross-curricular comprehensive units developed by teachers and students to bridge core content areas and implement recent technology strategies.

6–12; Teachers, Teacher Educators, Postsecondary Educators

Jumping into the Millennium with Students and Technology

Janie McClam (TX), Margie Villanueva (TX), Patty Urias (TX), Maria Muñoz (TX)

PS-M08-10, Table 6

Three multilingual elementary teachers and the literacy leader demonstrate successful use of technology and the Web in the classroom and the work environment. They will also discuss their school district's successful grantwriting initiative.

General, K–3, 4–6; Teachers, Postsecondary Educators, Coordinators, Teacher Educators

Change Teaching and Learning with Technology and Constructivism

Margaret Rice (AL), Elizabeth Wilson (AL), B. Joyce Stallworth (AL), William Bagley (AL), Keith Rice (GA)

PS-M09-10, Table 10

Discover how activities using technology and constructivism can help transform your classroom from a direct-instruction, teacher-centered environment into a student-centered collaborative environment.

University/College, 6–12; Teachers, teacher educators

Promoting Spanish Language Learning Adventures with Computer-Based Technology

Chris Wings (MA), Victoria Munroe (MA), Carol Holzberg (MA)

PS-M10-10, Table 11

See the benefits of adding several technology-rich computer activities (including multimedia CD-ROMs, e-mail, and Internet research) to Swift River's Spanish language curriculum.

General, K–12, K–8; Teachers, Teacher Educators, Coordinators

Assessment in and Evaluation of Online Learning

Jane Zahner (GA)

PS-M11-10, Table 2

A year of study was distilled into a Web-based course. Take an in-depth look at assessment and evaluation of students, faculty, courses, and programs delivered online.

Community College, University/College; Postsecondary Educators, Coordinators

Online Testing for the Classroom

Joseph Zisk (PA)

PS-M12-10, Table 8

Online testing provides unique opportunities for teachers to quickly and effectively assess student understanding of classwork and homework. Learn how to develop online tests.

General; Teachers, Teacher Educators, Postsecondary Educators

CONCURRENT SESSIONS

MON., 10 AM–12 NOON, CONT.

WEB POSTERS

All posters take place in Room 367W.

The Math Forum: How and Why Should You Use It?

Sheldon Berman (PA), Jody Underwood (PA)

IPS-M13-10, Table 18

Learn about the Math Forum, the hottest site on the Web for mathematics education. Explore Ask Dr. Math, Problems of the Week, Teacher2Teacher, and more!

K-12, Community College, University/College; Teachers, Teacher Educators, Postsecondary Educators

The Louisiana Challenge: A Systemic Model to Enhance Student Achievement

Karla Bowlin (LA), Dolores Champagne (LA), Willa Freeman (LA), Pam Quebodeaux (LA), Carol Wells (LA)

IPS-M14-10, Table 17

Challenge facilitators share how to increase student achievement through telecommunications by addressing professional development, school readiness, parental involvement, school-to-work transition, and lifelong learning skills.

K-12; Teachers, Coordinators

NASA Online Resources: Exploring Our World and Beyond

John Evans (VT)

IPS-M15-10, Table 15

NASA's Learning Technologies Project offers online resources in science and mathematics. Explore a world of NASA Web-based resources for educators.

K-12; Teachers, Teacher Educators, Coordinators

The Internet: Bridging the Gaps among Schools, Assessment, and Parents

Susan Graham (MA), Jennifer Degnan (MA)

IPS-M16-10, Table 23

The Internet provides parents and educators with a variety of assessment and personalization tools that aid in the selection of appropriate learning products and activities.

K-8; Teachers, Teacher Educators

Cumberland County Schools' Web Academy Reshapes Classrooms of the Future

Allan Jordan (NC), David Jackson (NC), Janet Kehoe (NC)

IPS-M17-10, Table 16

The Web Academy provides online instructional opportunities for students and staff. Look inside the academy to see how it benefits everyone.

General, 9-12; Teachers, Coordinators, Postsecondary Educators

Is Your Web Site Just Another Roadside Attraction?

Rick Monroe (AZ)

IPS-M18-10, Table 22

Ideally, the Web should promote the rehearsal and mastery of skills and thinking. Visit a site that does.

K-12; Teachers, Coordinators

Integrating Writing and the Internet Across the Curriculum

John Ost (NH)

IPS-M19-10, Table 19

Get strategies for online writing instruction and see demonstrations of the collaborative writing environment that is part of the author's Scribes Online series.

K-12; Teachers, Coordinators

Connecting Schools and Parents in a Meaningful Way: A Minneapolis District Project

Sheldon Ramnarine (MN)

IPS-M20-10, Table 21

Studies prove that increased parental involvement leads to higher student achievement, reduced absenteeism, and higher graduation rates. See how one large urban district is using the Web to get students, teachers, and parents involved and connected in a meaningful way to help students succeed.

General; Teachers

Jump-Start Integration with the Internet

Carol Siwinski (PA)

IPS-M21-10, Table 13

Combine productivity applications and the varied tools of the Internet for successful curriculum integration. Explore Web publishing, online telecollaboration, and integrated lesson plans.

General, K-12; Teachers, Coordinators

History beyond the Classroom Walls: Virtual Field Trips

Susan Smolin (NY), Michele Bower (NJ), Mary Ann Rota (NJ)

IPS-M22-10, Table 20

Construct Revolutionary War lessons around virtual field trips. Blend Web development, the Internet, and history—and leave the driving to us!

K-12; Teachers, Coordinators

The Good, the Biased, and the Ugly

Jana Tobbe Hickey (KY), Laura Clifford (KY), Cathy Watson Pittman (KY)

IPS-M23-10, Table 24

Explore this interactive Web-based project that investigates issues related to why Web information should be accessed only by an "informed" mind.

K-12; Teachers, Teacher Educators, Coordinators

INTIME: Integrating New Technology into the Methods of Education Using Online Video Best Practices

Karla Krueger (IA), Doreen Hayek (IA), Sharon Smaldino (IA)

IPS-M24-10, Table 14

This catalyst grant will generate videos on the Web showing PK-12 teachers integrating technology and components of quality education. The videos can be used in training preservice teachers.

K-12, University/College; Teacher Educators

MONDAY, 11 AM–12 NOON

SPOTLIGHTS

📼 Education and Democracy: Technology for What?

Carl Glickman, University of Georgia (GA)

M002 **Room: Ballroom IV**

Examine the purpose of American education and how rises in sophisticated technologies have coincided with decreases in ideals of democratic participation. However, technology can increase student achievement and participation.

K-12; Teachers, Teacher Educators, Coordinators

📼 Reach the Reluctants: Strategies to Win the Participation of Late Adopters

Jamie McKenzie, From Now On—The Educational Technology Journal (WA)

M003 **Room: Ballroom II/III**

In bringing new technologies into schools, we have paid too little attention to those who are reluctant. Discuss strategies for getting everybody up to speed.

K-12; Coordinators

📼 Switching Gears: Preparing Students for the Digital Economy

Alan November, Educational Renaissance Planners (MA)

M004 **Room: Ballroom I**

Technology is important, but it only represents the digital plumbing; the real learning revolution is in information and communications. Find out why we must replace teacher-student dependency with student self-directed and self-motivated learning.

General, K-12, Community College, University/College; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

The cassette icon (📼) indicates the session will be audiotaped. Please see page 9 for details.

CONCURRENT SESSIONS

PAPERS

Two papers per one-hour session.

Information Technology in Teacher Education: A Closer Look

Talbot Bielefeldt (OR)

M005 **Room: 268W**

ISTE reports on recent firsthand research into how teacher education institutions achieve integration of technology into their programs. In the research reported here, 416 U.S. schools, colleges, and departments of education were surveyed, with focus placed on integration of technology, facilities and infrastructure, field experience opportunities, and the ability to use common software tools

Community College, University/College; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

eEducation: Interdisciplinary Crossroads

Kathleen Micken (RI), Alan Cutting (RI)

M006 **Room: 268W**

This paper presents a framework for activities as well as assistive and instructional technology for students with mild to moderate disabilities.

K-12; Teachers, Coordinators

BEYOND THE CROSSROADS, WHERE DO WE GO FROM HERE?

Preparing Students and Teachers for Their Digital Worlds: Curriculum Evolution

Gordon Dahlby (IA)

M007 **Room: 255W**

Today's students and teachers are not only experiencing the early implications of growing up in an Information Age society, but also are going to live in it and shape it. Learn how curriculum and teaching and learning strategies are changing to help our learners excel. (Sponsored by ISTE's SIGTC)

K-12, University/College; Teachers, Postsecondary Educators

A Kid's of View Chicago: A Web Project of Child-Created Content

Karen Perrak (IL), Sherry Weinberg (IL), Elena Savoy (IL), Orrin Murray

M008 **Room: 254W**

Chicago Public School children welcome you to Chicago and NECC 2001 with this database-driven Web site. Explore how an entire learning community helped children create meaningful Web content.

General, K-12, University/College; Teachers, Postsecondary Educators, Coordinators

DISTANCE LEARNING

Videoconferencing Innovations and Issues: Museums and Their K-12 Colleagues

Timothy Barshinger (IN)

M009 **Room: 158W**

Learn how videoconferencing is used in informal learning environments to connect to K-12 students. Discuss research that examines the technology's use as an advanced organizer.

K-12; Teachers, Coordinators

Bridging the Digital Divide

Vicki Kajioka (HI), Donna Shiroma (HI)

M010 **Room: 368W**

Learn how technology and telecommunications are used to meet the needs of diverse learners in remote locations. Hawaii's E-School has developed standards-based courses for teachers and students. The presenters will share their successes and challenges in offering educational opportunities to students in rural settings.

General, K-12; Teachers, Coordinators

CONNECTING TECHNOLOGY TO TEACHING AND LEARNING

Management of Technology in the Classroom

Managing Technology in Your Busy Day!

Jillian Copeland (MD), Patricia Dougherty (MD), Shira Leibowitz (MD)

M011 **Room: 361W**

Primary teachers, here's your chance to discuss your issues and concerns about successfully integrating technology into your busy classroom. Learn management tips and model lesson plans, and create a network of problem solvers for long-term solutions.

K-6; Teachers, Coordinators

Health and Environmental Education

EnviroNet and HealthNet: Problem Based Learning Using Collaborative Data Collection

Kathleen Dunn (MA), Randi Lite (MA)

M012 **Room: 364W**

Engage your K-8 students in data collection, analysis, and interpretation by using student-generated health and environmental online data from HealthNet and EnviroNet.

K-8; Teachers, Teacher Educators, Coordinators

Fostering Critical Thinking, Empowering Students

ISTE K-12 Student Committee: Empowering Students in Education Reform

Marilyn Piper (WA), Al Rogers, Will Gage, Trong Pham, Emily McCartan, Ryan Powell

M013 **Room: 360W**

The ISTE K-12 Student Committee will host a panel discussion on how K-12 students are involved in ISTE projects and initiatives. This group will offer suggestions for meaningful ways to include students in education reform. The discussion will present compelling reasons for encouraging the development of K-12 student educational technology leaders. (Sponsored by ISTE)

K-12; Teachers, Coordinators

Logo's Second Millennium

Gary Stager (CA), Jeff Richardson (Australia), Steve Costa (Australia), Coleta Lewis (NY), Cynthia Solomon, Scott Perloff

M013a **Room: 157W**

Leading Logo-using educators will share their years of classroom experiences and insights on the role of computing in school reform. (A SIGLogo Society Session, sponsored by ISTE's SIGLogo)

General; Teachers, Teacher Educators, Coordinators

Language Arts and Social Studies

Grammar for the E-Literate

Lindy Sayers (TN), Lisa Springman (TN), Karen Douse (TN)

M014 **Room: 257W**

Grammar is the linchpin of language arts teaching; technology can complement grammar instruction. Exchange the old, boring books for a dynamic and effective approach to grammar instruction.

4-8; Teachers, Coordinators

Math and Science

To "Excel" in the Classroom Is Very Elementary

Kathy Adkins (GA), Sandy Beck (GA), Linda Spudic (GA)

M015 **Room: 260W**

Use Microsoft® Excel to spread excitement, collect information, and organize data to create templates and graphs to enhance classroom instruction. Cross-curricular examples will be shared.

K-8; Teachers, Teacher Educators, Coordinators

Dirt Detectives: Collaborative Online Learning Project

Judith Green (IL), Roslyn Glattman-Hirsch (IL)

M016 **Room: 166W**

Dirt Detectives allows chemistry students anywhere in the country to interact with the Argonne National Laboratory in the analysis of soil specimens. Data collected nationally can be analyzed and compared.

6-12; Teachers, Teacher Educators, Coordinators

MON., 11 AM-12 NOON, CONT.

Computer Science

Teaching Programming with WebToTeach

David Arnow (NY), Gail Miles (NC), Susan Dean (AL), George Crocker (AL), Anne DeFrance (MT), Gerald Weiss (NY), Gordon Bassen (NY)

M017 **Room: 366W**

CCSC members and others describe their experience using WebToTeach, an asynchronous learning network tool for introductory college and high school computer science. (CCSC Society Session)

Community College, University/College, 9-12; Teachers, Postsecondary Educators, Coordinators

Special Needs and Assistive Technology

Special Education Technology Applications for Students with Mild to Moderate Disabilities

J. Emmett Gardner (OK), Cheryl Wissick (SC), Dave Edyburn (WI), John Langone (GA)

M018 **Room: 156W**

Learn about strategies and resources that promote curriculum integration, Web-based instruction, multimedia and simulation activities, and assistive and instructional technology for students with mild to moderate disabilities.

K-12; Teachers, Coordinators

Internet/Web

Children and Search Engines: What's the Big Deal?

Barbara Hallstrom (GA), Anne Wallace (GA)

M019 **Room: 160W**

Welcome to our version of *Consumer Reports*, where third- and fifth-grade students evaluate "children's" Internet search engines. The results may surprise you.

K-8; Teachers, Coordinators

Support and Maintenance

SWAT Teams: Students Working to Advance Technology

Chuck Drake (VA), Lucy Miller (NC)

M021 **Room: 261W**

Learn how a SWAT team can advance your school's technology program. SWAT teams can assist your school and the community with their technology needs.

4-12; Teachers, Coordinators

The Kids Are Running the School (Network, That Is)

Charlanne Pook (KY), Barbara Barr (KY), Ginger Williams (KY), Val Gallutia (KY)

M022 **Room: 256W**

Spend some time with presenters from the Jessamine County Schools and learn how students run the network and train teachers. Discover how they get their training, what their jobs involve, and future plans.

General, K-12; Teachers, Coordinators

Funding, Planning, and Implementation

Implementing a Fiber-Optic Network in Schools

Debbie Haydock (MN), Jim Holland (GA)

M023 **Room: 362W**

Explore the use of fiber cabling for K-12 local area networks. Discuss how fiber cabling can provide a solid infrastructure for the future.

K-12, Community College, University/College; Coordinators

STAYING CONNECTED WITH PROFESSIONAL DEVELOPMENT

Staff Development

Getting to Wow! Moving Toward the Constructivist Classroom

Mary Burns (TX), Sharon Adams (TX)

M024 **Room: 264W**

We know those "wow" classrooms: Students are excited, active, and learning! See best practices and strategies for getting to "wow," presented by teachers and staff developers.

General; Teacher Educators, Coordinators

Teacher-Created Online Interactive Lessons: Tools and Training

Pamela Laverty (FL)

M025 **Room: 267W**

Discuss alternative methods of staff development and how these have enabled a greater number of teachers to be trained more effectively without disrupting normal school routines.

General, K-12; Teachers, Coordinators

Preservice and Graduate Teacher Education

Technology Innovations and Teacher Preparation through Partnerships and Grants

Curtis Ho (HI), Catherine Fulford (HI), Shuiquiang Zhang (HI), Annette Sherry (HI)

M026 **Room: 269W**

Through the leveraging of multiple grants and community partnerships, teacher education faculty have received training and support in redesigning their courses to address technology standards for preservice teachers.

K-12, University/College; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

STANDARDS, ASSESSMENT, AND ACCOUNTABILITY: STAYING CONNECTED

Understanding and Supporting Effective Technology Integration

Debra Rein (CA)

M027 **Room: 363W**

Explore the attributes of effective technology integration. Emphasis is placed on support strategies and the evaluation of effective practices. (Exhibitor presentation)

K-12; Coordinators

The School Odyssey: Using Digital Portfolios for Assessment and Accountability

David Niguidula (RI), Hilarie Davis (RI)

M028 **Room: 369W**

Participate in live assessments of student and school digital portfolios. Learn how your school community can use Web technology to take control of assessment and accountability.

General, K-12; Teachers, Coordinators

MOVING BEYOND THE CROSSROADS: TEACHERS AS AGENTS OF CHANGE

SCR*TEC Presents: Kids Are Key to Integrating and Supporting Technology

Douglas Adams (KS), Christy Blauer (KS)

M029 **Room: 165W**

Explore tools, models, and organizations that demonstrate how students and teachers can learn together. Students can be empowered as educational technology leaders and innovators.

General, K-12; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

CONNECTED COMMUNITIES: SCHOOLS, BUSINESSES, AND RESOURCES

Connecting Families and Schools through Technology

Paula Jameson (OH), Russell Chaboudy (OH), Judy Elfrink (OH), Liz Milford (OH), Dick Dembosky (OH)

M030 **Room: 161W**

Believing that the key to school success is family involvement, we have developed a technological system that actively involves working families in classroom activities.

K-12; Teachers, Coordinators

CONCURRENT SESSIONS

MONDAY, 12:30–1:30 PM

SPOTLIGHTS

Leading-Edge Computer-Using Teachers Profiled

Hank Becker, University of California–Irvine; Ronald Anderson (MN); Sara Dexter (MN); Jason Ravitz (CA); Margaret Riel (CA); Amy Ronnkvist (MN); Yani Wong (CA); Kimberly Burge (CA)

M031 **Room: Ballroom I**

Technology-using teacher leaders, practitioners of authentic learning, reform program participants, and educators in high-tech school settings are profiled using national survey data.

General, University/College, 4–12; Teachers, Coordinators, Postsecondary Educators

Building a Connected Learning Community: Learning for Life

Marcia Kuszmaul, Microsoft (WA); Mary Stephenson (WA)

M032 **Room: Ballroom IV**

New devices, powerful software, and a global explosion in Web services are empowering lifelong learning anytime, anyplace.

General; Teachers, Teacher Educators, Coordinators

Scoring High with New Technologies

Jamie McKenzie, From Now On—The Educational Technology Journal (WA)

M033 **Room: Ballroom II/III**

Discover how a technology program focused on literacy can dramatically improve the reading, writing, and reasoning powers of students.

K-12; Teachers, Teacher Educators, Coordinators

BEYOND THE CROSSROADS, WHERE DO WE GO FROM HERE?

From Knowledge Reproduction to Knowledge Building

Alan Whitworth (KY)

M034 **Room: 368W**

Uncover a learning model employed in more than 100 Kentucky classrooms. In this model, students create their own understanding and build a collective knowledge base.

4–12; Teachers, Teacher Educators, Coordinators

Best Practices in the Use of Information and Communication Technology

Peter Wright (Canada)

M035 **Room: 255W**

See key findings and recommendations from a series of 10 projects to determine best practices in the use of information and communication technology in K-12 classrooms.

General, K-12, University/College; Teachers, Coordinators, Teacher Educators

DISTANCE LEARNING

Quality in Distance Education Courses: A Case Study

Mary Wall (NJ), Joyce Grohman (NJ)

M036 **Room: 158W**

Learn practical, replicable strategies to assist schools in planning for and enhancing the delivery of distance education, both online and ITV. Receive workable plans to maximize resources, increase student access, and maintain quality in online course delivery.

General, Community College, University/College, 9–12; Teachers, Coordinators, Postsecondary Educators

CONNECTING TECHNOLOGY TO TEACHING AND LEARNING

Management of Technology in the Classroom

Next Steps for the One-, Two-, or Few-Computer Classroom

Anne Meyn (TX)

M037 **Room: 361W**

Maximize your resources. Learn tips and strategies to effectively integrate technology into the one-, two-, or few-computer classrooms with and without connectivity.

General, K-12; Teachers, Teacher Educators, Coordinators

Project-Based Learning

SMILE: Software Tools for Learning by Design and Project-Based Learning

Janet Kolodner (GA), Kristine Nagel (GA)

M038 **Room: 364W**

Experience a Supportive Multi-User Interactive Learning Environment (SMILE), developed to support collaboration, discussion, and reflection in project-based learning. Participants will use electronic whiteboarding, gallery walks, pinups, and storyboarding.

4–12; Teachers, Coordinators

Fostering Critical Thinking

Finding It on the Net: Being a Digital Detective

David Warlick (NC)

M039 **Room: 360W**

Conducting research on the Internet involves asking the right questions and interpreting the most useful clues. Learn to maximize your effectiveness in finding information on the Web.

K-12, Community College, University/College; Teachers, Coordinators

Preschool and Elementary

Using Electronic Books to Promote Vocabulary Development

Norman Higgins (NY)

M040 **Room: 257W**

Electronic books are fast becoming exciting ways to promote elementary-level vocabulary development. Learn techniques for maximizing the power of these resources in the elementary classroom.

K-6; Teachers, Teacher Educators, Coordinators

Language Arts and Social Studies

Kids, Museums, and Technology: New Media to Enhance Field Experiences

Kerri Smith (OR), Ronda Fritz (OR), Molly Smith (OR), Shirley Baxter (OR)

M041 **Room: 254W**

This session will take a closer look at the Trails Project, an Internet-based, U.S. government-funded project designed to integrate technology into the classrooms, develop online resources, and foster partnerships among historical sites and classrooms along the Santa Fe and Oregon Trails.

General; Teachers, Coordinators

Math and Science

Expressing Culture and Science through Technology and Community Links

Mary Beth Kelley-Lowe (ND), Don Yellow Bird (ND), Pat Donahue (ND)

M042 **Room: 166W**

Explore technology collaboration between elders, educators, and implementers. Experience an Internet-based, culturally rich curriculum and student projects from conceptualization to implementation and revision.

General, 4-8; Teachers, Coordinators

Building the Future: Assembling Computers with Your Middle-School Students

Paul Williams (VA), Sherry Ward (VA), William Dilamater (VA)

M043 **Room: 260W**

See how the Alexandria Country Day School has assembled an impressive collection of computers by teaching their middle schoolers to build them from scratch.

6-8, Coordinators

MON., 12:30-1:30 PM, CONT.

Computer Science

High-School Computer Science and IT Fluency

Philip East (IA)

M044 **Room: 366W**

An NRC Committee on Information Technology Literacy report suggests a "fluency" approach to "literacy." What might high-school computing courses influenced by the report look like?

Community College, University/College, 6-12; Teachers

Internet/Web

Effective Internet Content Management

Nate Casey (MN)

M045 **Room: 362W**

Find out how Internet content management software can be a valuable tool to enhance learning and can help you get the most from your existing Internet computer resources—even if you never use it to filter Web sites. (Exhibitor presentation)

General, K-12, Community College, University/College; Teachers, Coordinators

Cyberways and Waterways™: Turning Texas' Rivers into a Virtual Laboratory for Learning

Steve Amos (TX), Betty Stapp (TX)

M046 **Room: 160W**

The Cyberways and Waterways program integrates technology and education by means of an environmentally based curriculum centered on streams, rivers, coastlines, and oceans.

6-12; Teachers, Coordinators

Cablevision and Bethpage, New York: Partnering to Build a Lifelong Community of Learners

Jennifer Ostrager (NY), Tamara Black, Terence Clark

M047 **Room: 157W**

Discover how a partnership between Cablevision and the Bethpage, New York, community has created an environment for lifelong learning through its online education and professional development initiatives.

4-12; Teachers, Coordinators

Funding, Planning, and Implementation

Ringmasters, Clowns, and Tightropes: Educational Technology Management and Leadership

Annette Lamb (TX)

M048 **Room: 156W**

If you're supposed to be the ringmaster but feel more like a clown, this session will help you address 15 "biggie" educational-technology questions that teachers, parents, and school board members often ask. (Sponsored by the Association for Educational Communications and Technology [AECT])

General; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Moving beyond Hidden Roadblocks to Successful Technology Programs

Caylen Tichenor (GA)

M049 **Room: 256W**

Take a humorous, enlightening, and thought-provoking look at the typical roadblocks that are unwittingly erected to prevent instigation of a successful technology program.

K-12; Coordinators

STAYING CONNECTED WITH PROFESSIONAL DEVELOPMENT

Preparing Digital Age Teachers: Connecting University Training and Staff Development

Curtis Bobbitt (MT), Arlene Borthwick (IL), Evelyn Woldman (MA), Gordon Dahlby (IA), Dale Niederhauser (UT), Willis Binnard

M050 **Room: 268W**

This panel will help participants compare and contrast successful practices of teacher training in schools of education with successful practices of staff development within school districts. (Co-sponsored by ISTE's SIGTE and SIGTC)

K-12, Community College, University/College; Teachers, Teacher Educators, Coordinators

Staff Development

Successfully Developing Believers: Teachers Able to Dream in ICT

Mark Beach (BOP), Donna Broker (New Zealand)

M051 **Room: 264W**

Tahatai Coast School, one of New Zealand's leading ICT (information and communication technology) schools, offers a model of how ICT is made meaningful within the school environment.

General; Teachers, Coordinators

Web-Delivered Staff Development: Factors for Success

Scott Noon (CA)

M052 **Room: 363W**

Online professional development provides exciting teacher growth opportunities, but how do you determine which programs are effective and worth the costs involved? (Exhibitor presentation)

General, K-12, University/College; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Staff Development from the Classroom to the State: Working Models

Kathleen Webb (UT), Harvey Barnett (CA), Melanie Durfee (UT), Zach Tippetts (UT)

M053 **Room: 267W**

Discover staff development models for the class, school, district, and state levels. Locate free online manuals for 23 classes ranging from computer literacy to classroom integration.

K-12; Teachers, Coordinators

Preservice and Graduate Teacher Education

New Teacher Technology Preparation: Applications or Philosophy?

Patrick Levens (CA)

M054 **Room: 269W**

Should new teacher induction provide preparation that focuses on mastering microcomputer applications or provide a philosophical framework of reference relative to the use of technology as a curriculum tool?

K-12, University/College; Teachers, Teacher Educators, Coordinators

STANDARDS, ASSESSMENT, AND ACCOUNTABILITY: STAYING CONNECTED

Gauging the Impact-Technology in Schools

Cheryl Lemke (CA), Gil Valdez (IL)

M055 **Room: 261W**

What constitutes effective use of technology? Join this session if you want to jump into the fray of this difficult issue. Insights will be shared from a field project.

K-12; Teacher Educators, Coordinators

Web Portfolios: Assessment for the 21st Century

John Long (FL), Bert Miller (FL), Sue Comerford (FL)

M056 **Room: 369W**

Learn how to develop Web portfolios that will increase productivity and student achievement.

General; Teachers, Postsecondary Educators, Coordinators

MOVING BEYOND THE CROSSROADS: TEACHERS AS AGENTS OF CHANGE

Power to the Teachers: The Technology Minigrant Approach

Pamela Livingston (PA). Louise Barteow (PA). Holly Perry (PA). Janet Malloy (PA). Christopher O'Neill (PA). Katie Myles (PA)

M057 **Room: 165W**

Find out how a public and a private school empowered their teachers to create. through the use of minigrants. a dynamic technology curriculum.

K-12; Teachers. Coordinators

CONNECTED COMMUNITIES: SCHOOLS, BUSINESSES, AND RESOURCES

Funding Your Dreams: Grantwriting in the Information Age

Sheryl Abshire (LA). Glenn Johnson (NJ)

M058 **Room: 161W**

Need help obtaining funds to keep your school's technology program up-to-date? Explore grant development with a team of accomplished writers who will use your budget needs as examples in this active session.

General: Teachers. Teacher Educators. Postsecondary Educators. Coordinators

MONDAY, 1:30-3:30 PM

STUDENT SHOWCASE

Located on Level 2, opposite Room 265W.

Using Lab RATS to Create an After-School Technology Center

Debra Brown (TX). with students Reda Singletary. Te Lam. Valerie Porter. Linda Stevens. Janie Strader. Anjake Oza. Rafig Dhanani. Brandy Fonteneaux. Yared Martinez. Eliza Martinez. Ted Nguyen

Students are challenged. community members come to school. and the curriculum is transformed when you open an after-hours technology center. See how it's done!

General: Teachers. Coordinators

CATS: Computers as Tools for Students

Sue Campbell (WY). with students Chris Brown. Beth Lougee. Rhonda Schmidt

CATS pairs students with and without learning disabilities as Homework Buddies. Students. parents. and teachers learn to use computer-based study strategies to increase achievement.

General. K-12. Community College. University/College: Teachers. Coordinators

Let's Leaf through This

Cindy O'Sullivan (GA)

Integrated unit involving math. science. language arts. and technology using wireless laptop technology. This unit promotes cooperative learning. hands-on activities. research. application. and communication.

6-8; Teachers

SWAT Empowerment: Students Working to Advance Technology

Carmelita Santiago. Jean Childs Young Middle School (GA). with students April Goolsby. Tanisha Bell. Sade McLean. Christina Hardaway. Alisha Dockett. Derrick Barker. Gary Cage. Elisha Early. Daniel Ajo. Nthando Thandiwe. Derrius Dowell. Brandon Simmons. Alexander Hightower

SWAT creates a vehicle for students to learn Web site design and construction using a community publishing system and Netscape Composer integrated with finding the meaningful mathematics that is within their world. Learn how the OJT and leadership component begin to empower our total learning community.

6-12; Teachers

POSTERS

All posters take place in Room 367W.

Discovery Channel School's' Educator Workshop

Bob Anderman (MD)

PS-M25-1:30. Table 8

To complement its video products and Cable in the Classroom programming. Discovery Channel School offers educators access to free curricular resources online at DiscoverySchool.com. Learn to locate and adapt sample pages from the DCS library of lesson plans. teaching tips. and resource links.

K-12; Teachers. Coordinators

Develop Multimedia Tools to Support Functional and Community Training

Charles de Kraft (SC). Cheryl Wissick (SC). John Langone (GA). Windy Schweder (SC)

PS-M26-1:30. Table 7

Learn how educators and general education students worked with special education teachers to develop effective real-world activities for grocery shopping. positional concepts. cooking. sign recognition. and fast-food purchasing.

K-12; Teachers. Coordinators

Trails Projects Cyberneers: Integrating Technology with History

Joe Glotzbach (KS). Judeen Bachura (KS). Gordon Schmid (KS). Sheila Litke (KS). Mae Thomas (KS)

PS-M27-1:30. Table 11

Breathe life into history! Take old-fashioned activity cards to a new level with multimedia lesson plans.

4-12; Teachers. Coordinators

Linking Learning to Life: The Community as a Primary Source

Cindy Grabe (ND). Mark Grabe (ND). Jerry Feltis (ND)

PS-M28-1:30. Table 10

Authentic activity can be defined as functioning in the role of a practitioner. This presentation provides two examples in which technology involves students in the roles of biologist and historian as they gather and interpret information.

General. K-12; Teachers. Teacher Educators. Postsecondary Educators

Teaching Technology Together

Julie Hamilton (NE)

PS-M29-1:30. Table 6

Understand how technology can be integrated across the curriculum rather than taught as a separate strand. Student projects. collaborative lesson plans. and evaluations will be exhibited.

K-12. Community College. University/College: Teachers. Teacher Educators. Postsecondary Educators. Coordinators

Kentucky's Student Technology Leadership Program

Elaine Harrison (KY)

PS-M30-1:30. Table 3

Find out about STLP students' projects that have affected NETS and Kentucky Teacher Technology Standards. Projects include instructional. technical. and community themes.

K-12; Teachers. Coordinators

The School of the 21st Century

Vicki Kajioka (HI). Donna Shiroma (HI)

PS-M31-1:30. Table 4

If technology is the cultural signature of our future. let's invite our youth to join in its creation! To this end. the Hawaii Department of Education launched "E-School."

General. K-12. Teachers. Coordinators

Effective Integration of Technology into a K-4 Elementary School

Gailen Mitchell (NJ)

PS-M32-1:30. Table 12

How do you move teachers beyond basic technology skills to true integration? Discuss the best methods and strategies to solve all your dilemmas.

K-12: Teacher Educators. Coordinators

MONDAY, 1:30–3:30 PM, CONT.

TEAMS Distance Learning: Improve Instruction through Distributed Learning

Richard Nupoll (CA), Gayle Perry (CA)

PS-M33-1:30, Table 5
TEAMS Distance Learning involves classrooms across America in a unique model based on hands-on, meaning-centered student instruction and teacher professional development.
K-8: Teachers, Coordinators

Facilitating Online Learning: Supporting Learning in Virtual Communities

Raymond Rose (MA), Sarah Haavind (MA)

PS-M34-1:30, Table 1
Discover how to maximize the learning that takes place in online discussion groups by enhancing the skills of the group leader or moderator.
Community College, University/College: Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Current and Emerging Trends in Faculty Training and Development

Misty Smith (AL)

PS-M35-1:30, Table 2
Uncover the current models of faculty development that meet the challenges of teaching in the Information Age.
General, Community College, University/College: Coordinators

Inventors and Inventions That Changed the World

Dianne Tuttle (CA), Linda Reynolds

PS-M36-1:30, Table 9
What makes DaVinci, Ford, and Fleming alike? How does mold turn into penicillin? Everything you want to know and more about inventors and inventions!
General: Teachers, Coordinators

WEB POSTERS

All posters take place in Room 367W.

RUSDnet: Connecting Our Communities

Grace Boerner (CA)

IPS-M37-1:30, Table 23
This session highlights a districtwide Web site with special emphasis on instructional support, notably in "Especially for Teachers" curriculum resources. A number of state-of-the-art technologies are employed.
General, K-12, Community College: Teachers, Teacher Educators, Coordinators

Technology and the Modern Language Classroom

Maryanne Boettjer (PA)

IPS-M38-1:30, Table 24
Technology in the foreign-language classroom enhances students' knowledge of the world through opportunities to practice language skills. See sample projects, rubrics, templates, and student work.
General, K-12: Teachers, Teacher Educators

middleschool.com: Designed with the Middle-Level Educator in Mind

James Forde (CT), J. Howard Johnston (FL)

IPS-M39-1:30, Table 21
Join us for a discussion and demonstration of middleschool.com (produced by the Champion Middle School Partnership). It assists educators and administrators by providing content targeting their needs.
General, 6-8: Teachers, Teacher Educators, Coordinators

Weaving an Interdisciplinary Web: From Words on the Page to Multimedia on Stage

Susan Hunsinger-Hoff (PA), Graham Martin (PA), Phy Chauveau (PA)

IPS-M40-1:30, Table 14
Explore a dynamic, student-driven Web site rich in integrated technologies and interdisciplinary connections. This how-to session will inspire you to launch any class into cyberspace.
General: Teachers, Teacher Educators, Coordinators

Techs4schools: An Online Tech Support Community

Sophia Mansori (MA), Karen Smith

IPS-M41-1:30, Table 15
Techs4schools, a free service from TECH CORPS, connects technology coordinators with IT professional through a web-based mentoring program providing schools with tech support, advice, and resources.

The Lexipedia Process: Creating Concept Maps with Web-Based Dictionary and Thesaurus Resources

Robert Parks (NY), Jean Callahan (NY), Richard Kiely (NY)

IPS-M42-1:30, Table 19
Using the Wordsmyth Educational Dictionary-Thesaurus (www.wordsmyth.net), we demonstrate creation of computerized lexicons that open up conceptual and morphological pathways through dictionary, thesaurus, and media resources.
K-12, Community College, University/College: Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Odyssey Online: An Internet Resource for the Social Studies Classroom

Patricia Rodewald (GA), Nancy Clark (GA)

IPS-M43-1:30, Table 20
The Odyssey Online Web site features ancient Mediterranean and African objects as a focus for document-based learning in world history.
K-12: Teachers, Teacher Educators, Coordinators

Road Scholars Online: Fostering Critical Thinking on Real-World Issues

Elizabeth Schwartz (MO)

IPS-M44-1:30, Table 17
Join Road Scholars Online with Jeeves as we explore different ecosystems and interview stakeholders in real-world debates about environment, economics, and demography.
4-12: Teachers, Teacher Educators, Coordinators

Bringing Teachers Online with Web-Enhanced Staff Development

Jana Sladkova (NY), Emily Hacker (NY)

IPS-M45-1:30, Table 16
How do you make Web resources accessible to overworked, computer-novice instructors? See models of successful Web-enhanced staff development combining online and in-person instruction.
General, Community College: Teachers, Teacher Educators, Coordinators

Achieve Technology Proficiency for Educators and Students

Ron Stevens (CA), Marcia Sprang (CA)

IPS-M46-1:30, Table 13
Discover how educators achieve proficiency in technology. Use the IMMEX assessment software to create snapshots of students' information use and problem-solving strategies.
General, K-12, Community College, University/College: Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Early Connections: Technology in Early Childhood Education

Judy Van Scoter (OR)

IPS-M47-1:30, Table 18
Learn what technology can—and can't—do for young children. Be introduced to new online, research-based information and resources.
K-3: Teachers, Coordinators

Quick Starts: Web Toolboxes to Support Technology Integration

Cheryl Wissick (SC), Dave Edyburn (WI), Jim Gardner (OK)

IPS-M48-1:30, Table 22
Receive Quick Starts to Web sites for models of technology integration, virtual field trips, thematic units, and interactive educational games.
K-12: Teachers, Teacher Educators, Coordinators

MONDAY, 2–3 PM

SPOTLIGHTS

Teach to Learn: Positive Practices in Professional Development
Sara Armstrong, The George Lucas Educational Foundation (CA)
M059a **Room: Ballroom II/III**
Dedicated to telling the stories of education, the George Lucas Educational Foundation shares current research and best practices from schools and programs across the country.
General: Teachers, Teacher Educators

Staff Development: A Key to Technology's Effect on Learning
Stephen Barkley, Performance Learning Systems (GA)
M059 **Room: Ballroom I**
Technology can affect student learning in our schools as long as teachers are provided with effective teaching tools. Explore learning versus teaching, job-embedded staff development, and more.
General: Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Identifying Some of the Best IT Projects in the United States
David Moursund, ISTE (International Society for Technology in Education) (OR)
M060 **Room: 254W**
The U.S. Department of Education periodically identifies promising and exemplary information technology (IT) in education projects. Methods, criteria, and results for the first year will be presented.
General: Teachers, Teacher Educators, Coordinators

Snapshot Surveying Teachers and Administrators around the Country
Cathie Norris, University of North Texas; Neal Topp (NE); Elliot Soloway (MI)
M061 **Room: Ballroom IV**
Rather than guessing at the activities, beliefs and needs of teachers and administrators with respect to technology in education, we have been conducting snapshot surveys of educational professionals around the country. For example, we will report on a statewide survey of all teachers in Nebraska using our Web site (http://snapshotsurvey.org). Armed with the responses from these surveys, we make suggestions for how schools address professional development, technology purchases, and curriculum integration.
K-12; Coordinators

THANK YOU, VOLUNTEERS!

BEYOND THE CROSSROADS, WHERE DO WE GO FROM HERE?

New Horizon on the Desktop: Thin Client Solutions for Educators
Karen Greenwood (CA)
M062 **Room: 363W**
Find out how thin clients marry the low-cost, easy-to-use interface of PCs with the power and security of mainframe computers to create a flexible, scalable solution for schools. (Exhibitor presentation)
General: Teachers, Coordinators

DVD: The New Communication Disease Everyone Wants to Catch!
Gail Wortmann (IA)
M063 **Room: 257W**
Witness the contagious excitement that DVD generates in the classroom. See specific examples of DVD in content application (including barcodes, video blackboard, etc.). Share curricular integration possibilities.
General: Teachers, Teacher Educators, Postsecondary Educators

DISTANCE LEARNING

Free Tools for Organizing Online Learning
Andrew Brovey (GA)
M064 **Room: 368W**
These online tools may not be fancy, but they are free! See and experience no-cost options for Web-based discussions, resource sharing, and assessment.
Community College, University/College, 6-12; Teachers, Coordinators, Teacher Educators, Postsecondary Educators

Online Teaching through Online Learning
Bruce Droste (MA)
M065 **Room: 362W**
Virtual High School's online Teacher's Learning Conference (TLC) prepares educators for successful teaching in an online environment through instruction in online pedagogy, assessment, and standards. (Exhibitor presentation)
9-12; Teachers, Coordinators

CONNECTING TECHNOLOGY TO TEACHING AND LEARNING

Instructional Strategies and Technology Integration

Integrating Technology with Classroom Curriculum, Library, and Fine Arts
Judy Clark (TX), Barbara Cardon (TX), Sandy Whitney (TX)
M066 **Room: 361W**
Learn how research-based instruction integrates computer technology with curriculum, library research, and fine arts to create an enriching learning experience for students.
General, K-8; Teachers, Coordinators

Multimedia

New Models for School Collaboration: Multimedia Projects in the Classroom
Marie Sayles (CA), Ron Dack (CA), Susan Mahony (CA)
M067 **Room: 364W**
Talk about integration! Learn how one center piloted a collaboration with six schools to support multimedia projects integrating arts and technology into classroom curriculum.
4-12; Teachers, Coordinators

Promoting Interdisciplinary Learning

The Great Chocolate Experience
Glenda Bequette (IL)
M068 **Room: 360W**
Hear how your class, school, district, province, or state can be involved in this "chocolaty-good" project that integrates technology into any grade level, across all disciplines, and correlates with the Illinois Learning Standards and National Educational Technology Standards.
K-12; Teachers, Teacher Educators, Coordinators

Preschool and Elementary

K-3 Technomaniacs
Michelle Webb-Upham (AZ), Susan LaValley (AZ)
M069 **Room: 255W**
Technology is a tool for enhancing your curriculum. Find out about the appropriate use of software and the Internet in the K-3 classroom.
K-3; Teachers, Teacher Educators, Coordinators

MONDAY, 2–3 PM, CONT.

Math and Science

Get the Picture- Visualization Tools for Science and Math

Bob Kolvoord (VA)

M070 **Room: 166W**

Visualization tools provide new avenues of exploration for science students. Discover software and curriculum for integrating computers in teaching and learning science skills and content.

General: Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Computer Science

How to Improve Your Students' Results in AP Computer Science

Charles Rice (NY), Maria Litvin, Debbie Carter, Joe Kmoch

M071 **Room: 366W**

A panel of experienced computer science teachers who are also AP exam readers will present fresh ideas on how you can improve the results of your students on their AP computer science tests. Learn what you and your students should focus on.

K–12; Teachers, Postsecondary Educators, Coordinators

Special Needs and Assistive Technology

Project GENASYS (Generating Assistive Technology Systemically)

Libby Cohen (ME), Dale Blanchard (ME), Deb Dimmick (ME), Nancy Lightbody (ME), Loraine Spenciner

M072 **Room: 260W**

By incorporating learner-centered principles to deliver support technology, specialized software, and Web accessibility, Project GENASYS stimulates powerful changes in how educators teach all students.

Community College, University/College: Teacher Educators

Internet/Web

Curriculum Tools for Your Imagination

Laura Hunter (UT), Kathleen Webb (UT)

M073 **Room: 160W**

Create a weather station. Create a curriculum-based Web site. Create a Web activity. Create an online class. Free online tools make it easy and fun!

K–12, Community College, University/College: Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Developing Teacher and Student Relationships Across the Distance: Global Connections

Laura Mates (IN), Susan Golder (PA), Donna Wilkin (IA), Nancy Alberti

M074 **Room: 157W**

Join us as teachers, students, and administrators from various locations in the United States and Italy share a collaborative project in teaching and learning with technology. (Sponsored by ACM SIGCUE)

K-12: Teachers, Coordinators

Support and Maintenance

Computer, Heal Thyself! Helping End Users Become Technology Responsible

Michael Houser (Germany), Marcia Applegate (Germany), Tom Posey (Germany)

M075 **Room: 261W**

Explore three topics that will help end users to work rationally and technology to operate flawlessly: (1) Steps to Computer Independence, (2) Calamity Avoidance, and (3) Crash! Yikes! What Now?

General; Teachers, Coordinators

Funding, Planning, and Implementation

eIntegration.com- Buying in to Technology Integration

Marguerite Hart (IN), Ruth Huff (IN), Sandy Rogers (IN)

M076 **Room: 256W**

This session will focus on how one district created an environment for using technology as a tool for teaching and learning. Leave with a plan you can replicate.

K–12; Teachers, Teacher Educators, Coordinators

Early Adopters of Technology in a University Setting

Karen Oates (GA)

M077 **Room: 158W**

Review a recent research study of university faculty members who are considered to be early adopters of technology and consider the study's effect on technology workshop development.

Community College, University/College: Postsecondary Educators, Coordinators

STAYING CONNECTED WITH PROFESSIONAL DEVELOPMENT

Developing a School Networking Course

Cathy Cavanaugh (FL), Terence Cavanaugh (FL)

M078 **Room: 156W**

When schools become networked, who keeps the network operating? Help educators satisfy their need for networking knowledge by offering a course in networking. Learn how we created ours.

General; Teachers, Postsecondary Educators, Coordinators

Staff Development

BUILT for the Bayou: Building Understanding & Instructional Leadership through Technology

Felicia Coleman (LA), Sheryl Abshire (LA)

M079 **Room: 264W**

BUILT for the Bayou is a professional development catalyst for educational improvement in southwest Louisiana, targeting preservice educators, district-level technology mentors, and university professors.

General, K–12, University/College: Teachers, Teacher Educators, Coordinators

Preservice and Graduate Teacher Education

K-16 Technology Integration for Improved Learning

Tim Best (OH), Jennifer Moormeier (OH), Bonnie Brownstein (NY), David Fletcher (NY)

M080 **Room: 268W**

Using technology frameworks and planning tools, preservice and practicing teachers design classroom experiences that emphasize technology and align curriculum, instruction, and assessment.

General, K–12, Community College, University/College: Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Integrating Technology into Teacher Education: Project THREAD, A Progress Report

David Heflich (NV), Neal Strudler, Donald Anderson

M081 **Room: 269W**

A report on the progress of Project THREAD, a federally funded attempt to fully integrate technology into the preparation of preservice teachers at UNLV.

K–12, Community College, University/College: Teacher Educators, Postsecondary Educators, Coordinators

STANDARDS, ASSESSMENT, AND ACCOUNTABILITY: STAYING CONNECTED

NETS for Teachers: Foundation Standards and Essential Conditions

Lajeane Thomas (LA), Peggy Kelly (CA), Gary Bitter (AZ), Heidi Rogers (ID), Carol Hruskocy (WV)

M082 **Room: 369W**

Participants will have the opportunity to get more information about NETS for Teachers: Foundation Standards and Essential Conditions and understand how this latest release fits into broader NETS initiatives. (Sponsored by ISTE)

K–12, University/College: Teachers, Teacher Educators

MOVING BEYOND THE CROSSROADS: TEACHERS AS AGENTS OF CHANGE

Village Green: Facilitating Change in a Learning Community

Lori Mullen (SC), Laura Stanton (SC)

M083 **Room:** 165W

Examine the effect technology has had on the teachers and schools in Greenville, South Carolina. Find out how technology has been integrated across all grade levels and disciplines with a focus on the arts.

General; Teachers, Coordinators

CONNECTED COMMUNITIES: SCHOOLS, BUSINESSES, AND RESOURCES

Peace Partners: Creative Expressions in a City of Violence

Elizabeth Moore Rhodes (LA), Lori Kennedy-Roark (LA), Loren Blanchard (LA)

M084 **Room: 161W**

Can creative expressions be used to transcend aggression among adolescents in the local culture? Look at a partnership for peace in New Orleans that uses technology as the primary medium for exploring this question.

K-12, University/College; Teachers, Teacher Educators, Coordinators

Social, Ethical, and Policy Issues

Digital Copyright from the Teacher's Desk

Caroline McCullen (NC), Mary Musacchia (NC)

M085 **Room: 267W**

Need help sorting through the maze of copyright issues and how they apply to your students? Get up-to-date answers from a teacher and a lawyer who deal with copyright issues daily, and see real-world examples of properly documented projects.

General, K-12; Teachers, Teacher Educators, Coordinators

MONDAY, 3:30–4:30 PM

SPOTLIGHTS

The Supreme Court Is in Session: Ask the Experts

Larry Anderson, Mississippi State University; Al Rogers (CA); Cheryl Lemke (CA); Bonnie Bracey (VA); Margaret Honey (NY); Andy Carvin (DC)

M086 **Room: Ballroom I**

Premier leaders of technology gather in one place so you can ask them your burning questions. Join us and discuss today's most critical issues!

General; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Preparing to Teach 21st Century Learners

Thomas Carroll, U.S. Department of Education (DC)

M087 **Room:** Ballroom IV

Preparing technology-proficient educators to meet the needs of 21st Century learners is a critical issue for teacher preparation programs across the country. The panel will report on the progress of the Preparing Tomorrow's Teachers to Use Technology (PT^3) grants and next steps in this rapidly growing initiative.

Community College, University/College; Teachers, Teacher Educators, Postsecondary Educators

Thinking Visually with WebQuests

Bernie Dodge, San Diego State University (CA)

M088 **Room:** Ballroom II/III

WebQuests require learners to design, infer, create, and agree. Learn 10 ways to support thinking in a WebQuest with graphic organizers.

General; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

BEYOND THE CROSSROADS, WHERE DO WE GO FROM HERE?

Student and Teacher Partnerships: Making It All Happen

Dennis Harper (WA), James Smith (WA), John Hardy (WA)

M089 **Room: 254W**

Learn how students are taking a lead in their own education. The Generation www.Y model trains K-12 students to partner with teachers to integrate technology into the curriculum. Forty states and more than 1,000 schools are using it.

K-12, University/College; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

All Roads Lead to Home: An Integrated Technology Curriculum

Margaret Hollies (IN), Donna Skeens (IN), Beth Lehner (IN), Barbara Danquist (IN), Julie Clark (IN), Marcy Miller (IN)

M090 **Room: 255W**

Take a closer look at the All Roads Lead to Home Project and find out how this integrated technology project has touched the curriculum across all grade levels and united the entire educational community.

General, K-12; Teachers, Teacher Educators, Coordinators

Internet2: Network Revolution for the New Millennium

Jiang lan (AL)

M091 **Room: 158W**

Find out how Internet2 intends to establish a multimedia academic broadband network operating at least 100 times faster than today's networks. More than 100 universities have joined forces with government and industry to employ Internet2.

General, K-12, Community College, Postsecondary Educators, Coordinators

DISTANCE LEARNING

Putting a Course Online: Teamwork, Creativity, and the Bottom Line

Nancy Boling (MS), Shirley Smith (SC), Lucy Ferron (MS), Les Charlton (MS), Vicki Shirley (MS)

M092 **Room: 368W**

This session will emphasize the process of creating a "real" online school complete with interactive classroom, library, conference room, and student lounge. Developed for the Advanced Placement Calculus course offered by SERC (Satellite Educational Resource Consortium), it is used by the instructor and students to communicate, collaborate, and motivate each other in the learning process.

General; Teachers, Curriculum Specialists

CONNECTING TECHNOLOGY TO TEACHING AND LEARNING

Instructional Strategies and Technology Integration

Technology: Courage and Confidence

Paula Duncan (SC), Teresa Bromley (SC), Judy Parham (SC), Jolynn Allen (SC) Linda Babb (SC)

M093 **Room: 361W**

Learn how you can use a variety of technology tools to change your teaching methods at the high-school level and empower your students to become active learners and presenters.

9-12; Teachers, Coordinators

Project-Based Learning

Entrepreneurship Education: Living the Life of an Entrepreneur

Mathew Georghiou (NS)

M094 **Room: 363W**

Explore the barriers, challenges, and solutions to effectively delivering entrepreneurship education. Includes demonstration of GoVenture® Live the Life of an Entrepreneur software simulation program. (Exhibitor presentation)

General, Community College, University/College, 6–12: Teachers, Postsecondary Educators, Coordinators

📼 From Cybraries to Electronic Postcards: K-12 Collaborative Environments on the Internet

Bonnie Thurber (IL), Bob Davis

M095 **Room: 364W**

See easy-to-develop online communities used by K-12 teachers that include Web pages and dynamically generated virtual libraries, online surveys, electronic postcards, and book reviews.

K-12, teachers, Coordinators

Assessing Student Learning and Connecting to Standards and Assessment

📼 Beyond Multiple Choice and Scores: The IMMEX Problem-Solving Assessment Approach

Joycelin Palacio-Cayetano (CA), Jimmy Ikeda (CA)

M096 **Room: 156W**

Explore how educators are engaging students in problem solving and self-assessment of strategies using IMMEX assessment software that generates real-time snapshots of students' problem solving.

K-12, Community College, University/College: Teachers, Postsecondary Educators, Coordinators

Language Arts and Social Studies

Cross-Cultural Understanding through Playful Online Class

Konno Eriko (Japan), Ohtani Chie (Japan), Kazuki Yoshitomi (Japan)

M097 **Room: 157W**

The Nippon Educational Computing Association (Japan) presents their research into the impact of online learning in an eighth-grade classroom, including its promotion of cross-cultural understanding.

K-12: Teachers

📼 Shouting Out the Window: Students Publish Online

Susanna Lang (IL)

M098 **Room: 257W**

Publishing can build a young writer's self-esteem in a variety of ways. Explore a variety of publishing options made possible by the Internet with authorities who have written extensively about writing workshops and the value of publication.

K-12: Teachers, Teacher Educators, Coordinators

Computer Science

Addressing Prerequisite Deficits within the Curriculum to Improve Outcomes for Underprepared and Nontraditional Students

Helene Bergman (NY)

M099 **Room: 366W**

How can we better prepare our college and university students for the rapidly evolving data communications industry? Find out how one computer science department revamped its curriculum to address this issue.

Community College, University/College: Postsecondary Educators, Coordinators

Special Needs and Assistive Technology

Where the Crossroads Meet: Software Solutions for the Total Classroom

Lynne Cater (GA), Pam Zipperer (GA)

M100 **Room: 260W**

Educators may feel apprehensive when faced with the task of adapting technology for children with special needs. See popular software that uses existing solutions to bridge this technology gap.

K-12: Teachers, Teacher Educators, Coordinators

Internet/Web

Cultural Connections: Similarities in Technology, Teleresearch, and Classroom Practices

Dorothy Valcarcel Craig (TN), Alfonso Bustos Sanchez (Mexico), Jaci Stewart (TN)

M101 **Room: 160W**

This panel presentation reveals significant findings from three student inquiry and teleresearch projects conducted in the United States and Mexico. Project results, classroom implications, and replication suggestions are discussed.

K-12, University/College: Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Funding, Planning, and Implementation

📼 Common Experiences: Establishing District Priorities for Technology and Curriculum Integration

Marielle Palombo (MA), Rob Ramsdell

M102 **Room: 256W**

Get introduced to a model for establishing district and school priorities for technology and curriculum integration. Learn practical tools, ideas, and strategies.

General: Teachers, Coordinators

Evaluation

📼 Evaluation Mapping and Planning Tools for the Technology-Supported Classroom

John Cradler (CA), Betsy Goeltz (ID), Ruthmary Cradler (CA)

M103 **Room: 261W**

This presentation provides educators with a new and tested process for planning and conducting credible evaluations of the effect of technology on student learning. The process not only provides evaluation information required by most state and federal funders but also gives teachers and administrators the information needed to help make ongoing improvements in the use of technology.

General: Teachers, Teacher Educators, Postsecondary Educators

Research

Using Video to Document Technology Infusion in Our Schools

Marcie Bober (CA), Ellie Lynch (CA)

M104 **Room: 360W**

Videotape is an underused resource for data analysis. If used creatively and studied thoroughly, it allows researchers and evaluators to conceptualize technology infusion from new angles and perspectives.

K-12, University/College: Teachers, Postsecondary Educators, Coordinators

STAYING CONNECTED WITH PROFESSIONAL DEVELOPMENT

Strategies for Technology Leadership: Administrators as Models

Eileen Gallagher (IL), Yvette Chisom (IL)

M105 **Room: 166W**

Helping administrators become active users of technology and model its appropriate use can help your school in integrate technology. Get ideas from Chicago (Illinois) Public Schools on how to implement a professional development program targeted to administrators at your school.

General: Coordinators•

Staff Development

OnLy U: Teaching Teachers to Use Technology

Samantha Morra (NJ)

M106 **Room: 267W**

Learn about an exciting and unique year-long staff development program designed to empower teachers with the tools and skills necessary to successfully use technology.

K-12: Coordinators

Georgia's High School InTech: What Is It Like?

John Wiggins (GA), Mimi McGahee (GA), Diane Barron, Jeffrey White, Beaumie Kim, Kim Nichols

M107 **Room: 264W**

If you wonder what all the excitement about Georgia's InTech is about, or if you're designing technology professional development for your school district or state, drop in!

University/College, 9-12; Teachers, Teacher Educators, Coordinators

Preservice and Graduate Teacher Education

Build a Vision for Technology Integration

Ann McCoy (AK)

M108 **Room: 269W**

Using ISTE/NCATE Standards, faculty identified expectations for students' technology use and barriers to technology integration. Faculty development models were created and evaluated for effectiveness.

General, University/College; Teacher Educators, Postsecondary Educators

Video Streaming = Exemplary Teaching

Mimi McGahee (GA), Dwayne Trouille (GA)

M109 **Room: 268W**

For preservice and inservice teachers to gain insight into the impact of technology integration into the curriculum, Valdosta State University streams video of master teachers of technology integration.

K-12, University/College; Teachers, Teacher Educators

STANDARDS, ASSESSMENT, AND ACCOUNTABILITY: STAYING CONNECTED

The Clearinghouse Presents: Electronic Learning Resources for the New Millennium

Brian Bridges (CA)

M110 **Room: 369W**

Celebrate the best English/language arts, history/social science, mathematics, and science software evaluated by the Clearinghouse during the last year. Clearinghouse staff will demonstrate these programs, distribute Director's Choice booklets, and explore the Clearinghouse Online Web site.

General; Teachers, Teacher Educators, Coordinators

MOVING BEYOND THE CROSSROADS: TEACHERS AS AGENTS OF CHANGE

Internet Tools for Teachers!

David Dockterman (MA)

M111 **Room: 362W**

This session will assist teachers in learning about the tools and services available that can connect their work life at school to the work they carry home. It will also demonstrate how the Internet can help teachers prepare for the classroom and reach outside the school. (Exhibitor presentation)

K-8; Teachers, Teacher Educators, Coordinators

Getting Published: Sharing Technology Successes with Others

Carol Simpson (TX), Shelley Glantz (OH), Kathy Schrock (MA), Ferdi Serim (NM), Renee Olson (NY)

M112 **Room: 165W**

Editors and writers for school technology publications share tips and insights about writing and reviewing for publication. Learn what editors look for and how to submit your ideas.

K-12; Teachers, Coordinators

CONNECTED COMMUNITIES: SCHOOLS, BUSINESSES, AND RESOURCES

Linking Schools and Communities: The Local Access Connection

Jerry Abraham (MN)

M113 **Room: 161W**

See how a local school district in Minnesota has contracted with the city to manage and operate its community local access channel. Watch samples of various programs and find out how you can establish a similar agreement.

General; Coordinators

MONDAY, 5–6 PM

"THRASHERS"-OF-A-FEATHER SESSIONS

More topics and sessions may be available. See the NECC Info Booth and/or the daily newsletter for additional topics added since press time.

Technology in Teacher Education

Room 165W

Roger Carlson

Sail the Net: Internet Safety Rules

Room: 366W

Kob Herlong

USA-Germany Partnership-Laptop Computers for Teachers and Students

Room: 161W

Mark Keith

Online Professional Development

Room: 158W

Gary Maestas

Using the Internet as an Educational Tool

Room: 360W

Mary McNabb

Connecting around the World with Compressed Video

Room: 361W

Al Mizell

Digital Portfolios for Students, Teachers, and Schools

Room: 156W

David Niguidula, Helen Barrett, Hilarie Davis

Web-Based Resources: K-12

Room: 368W

Gwendolyn Peart

Project RAM

Room: 369W

Barbara Rouse

Eco-Connections

Room: 363W

Matt Stacey

School Libary Media Specialists

Room: 166W

Theresa Slosek, Joyce Valenza

CHECK THE DAILY NEWSLETTER FOR ADDITIONAL THRASHERS TOPICS!

TUESDAY, 8:30–10 AM

KEYNOTE

Computers, Connections, and Community: Why We Care and Why It Matters

Craig Barrett, Intel Corporation (CA)

T001 **Room: Hall G**

As classrooms transition into the new millennium, technology is a critical tool for schools. However, new developments are occurring at breakneck speeds. Educators find themselves staring into the box of a 5000-piece technology puzzle. In this presentation, Kuglin will demonstrate the availability of the puzzle pieces and demystify the process for connecting them in a manner that leaves participants feeling comfortable. Kuglin will highlight current and emerging Internet, video, computer, and satellite technologies with suggestions for implementing these tools in a cohesive manner. (See page 4 for a biography of this speaker.)

with Special Presentation by U.S. Secretary of Education, Richard W. Riley.

TUESDAY, 10 AM–12 NOON

STUDENT SHOWCASE

Located on Level 2, opposite room 265W.

Weaving Technology through Your Curriculum

Lori Brandman, Shallowford Falls Elementary–Cobb County Schools (GA), with students Amanda Ku, Kristin Hooper, Audrey Hall, Sean Hellman, Austin Freese, David Tatuin

Fifth-grade students show how to use bookmarked sites on the Internet and programs such as Microsoft® Word, PowerPoint®, Microsoft Publisher, and Inspiration® to enhance their learning in all curriculum areas.

K–8; Teachers

Technology Fair: Students Preparing, Producing, and Presenting

Sherah Carr, Alton C. Crews Middle School (GA), with students Laura Bishop, Laura Wood

See projects that middle-school students presented at their school's instructional technology fair. Learn how the fair was organized, advertised, and supported by the community.

K–12; Teachers, Coordinators

Potter Mania

Karen Conner, Huntsville City Schools–Chapman Elementary (AL), with students Jared Brown, Chris Lovoy, Katie Morring, Trevor Jones, Evan Wells, Amber Wilbourn

"Potter Mania" is a thematic unit based on the Harry Potter books by J. K. Rowling integrating the use of technology. The students produced a multimedia presentation as a culminating activity. It is an Alabama Council for Technology Education award-winning presentation.

General, K–12

Technology Across the Curriculum

Mark Rice, West Jasper School/William Carey College (MS)

See 10 years of state, national, and international award-winning projects (Grades 2–12) designed around HyperStudio®, simulations, and real-world across-the-curriculum student projects. See and learn how technology has reformed a rural school.

K–12, University/College; Teachers, Postsecondary Educators, Coordinators

POSTERS

All posters take place in Room 367W.

Never Too Young to Be Stars

Marsha Boring (CA)

PS-T49-10, Table 11

Kindergartners love to be movie stars! Think they're too young for technology? See what five year olds can do!

K–6; Teachers, Coordinators

Surfing in to the 21st Century: The Technology-Rich Inclusive Classroom

Kari Bowen (IL), Heather Cook (IL), Kim Crum (IL), Karon Gephart (IL)

PS-T50-10, Table 5

See how the latest software and hardware has been used with successful inclusive classrooms. Take home examples of collaboration projects, rubrics, Internet use, and much more.

General, 4–8; Teachers, Coordinators

Celebrating Diversity in Turkey: The Land Where East Meets West

Joy Brenneman (MA), Erin Williams (MA), Carol Holzberg (MA)

PS-T51-10, Table 6

Learn about a schoolwide project integrating several computer-based activities (e.g., Internet research, e-mail, and electronic presentations) into the study of Turkish people and culture.

General, K–12; Teachers, Teacher Educators, Coordinators

Bridging the Gap between Communities and Schools through Technology

Sandy Einsel (AL)

PS-T52-10, Table 9

The Internet offers exciting possibilities for informing communities about what students are learning. Learn how to link community and schools through technology.

General, 4–12; Teachers, Teacher Educators, Coordinators, Postsecondary Educators

TEACH-IT: Technology for Teachers, By Teachers

John Fulwiler (LA), Rosalind Hale (LA), Charles Duffy (CA), Debra Bordelon, Charles Sevick

PS-T53-10, Table 2

A historically Black university engages preservice and noncertified teachers in a continuum of instruction, training, workshops, and service learning in the community through various technological delivery systems.

K–12, University/College; Teachers, Teacher Educators, Coordinators

An Education in Online Learning

Nancy Haas (CA), Sylvia Martinez (CA), Dan LaFountain (MD), Gary Stager (CA)

PS-T54-10, Table 1

Can online learning be more than just delivering lectures on the Internet? See how an online educational program can create learning communities through existing, affordable technology.

K–12, Community College, University/College; Teachers, Teacher Educators, Coordinators

SMILE: Student Mentors in Learning Experiences

Denise Harrell (IN)

PS-T55-10, Table 4

SMILE is a mentoring club in which elementary students become technology experts and use their newfound talents to assist teachers and peers. Receive information about starting a SMILE group in your school.

General, K–12; Teachers, Coordinators

Water: Running through the Curriculum

Sheila Kelly (MA)

PS-T56-10, Table 10

Water as a theme for science, ecology, and history, pervades our curriculum. Enhance students' understanding of the water cycle through satellite imaging and other technology.

General, 4–8; Teachers, Coordinators

Student Work in a Problem-Based Learning Unit

Cindy Kovalik (OH)

PS-T57-10, Table 3

Problem-based learning invites alternative assessment strategies. This poster session showcases seventh-grade student work from a technology integration initiative using problem-based learning as an instructional strategy.

General, K–12, University/College; Teachers, Teacher Educators, Coordinators

The Educational Technologist as Curriculum Specialist

Kevin McGillivray (Germany), Elizabeth Walker (Germany), Gene Knudsen (Germany), Oren Edie (Germany), Tara Beau (Germany), Bonnie Hopkinson, Tom Perreault, Sonja Border

PS-T58-10, Table 8

How can we best assist teachers to make the most effective connection between software tools and curriculum? Hessen Educational Technologists will share their model.

General, K-12; Teachers, Teacher Educators, Coordinators

Virtual Learning Interface for K-12 Education

Arthur Recesso (GA)

PS-T59-10, Table 7

Interact with virtual characters as they demonstrate their ability to teach students and support classroom learning. Characters speak and have students solve problems.

K-12; Teachers, Teacher Educators, Coordinators

Videoconferenced Family Powwows with Native American Keypals: Online Culture Sharing

Agnes Zaorski (NJ)

PS-T60-10, Table 12

Videoconferenced family powwows with our Native American key pals will facilitate a 21st century style of the Native American "storyteller" oral tradition.

General, K-8; Teachers, Teacher Educators, Coordinators

WEB POSTERS

All posters take place in Room 367W.

Science, the Web, and a New Regionalism

Joseph Blessing (GA), Ann McCartney (GA)

IPS-T61-10, Table 15

Learn how to develop a Web site that integrates science and technology into the curriculum, uses the school district's network, and creates a community of learners.

K-12; Teachers, Coordinators

Step Up to 2000: Internet Reading Corner for Children

Joyce Cartwright (TX)

IPS-T62-10, Table 19

Visit the online reading corner for a variety of elementary-level children's stories. Read or listen to fairy tales, fables, poems, folktales, and nursery rhymes.

K-6; Teachers, Coordinators

Lessons and Links for Multicultural Resources

Ronald Helms (OH), Colleen Finegan (OH), Bonnie Mathies (OH)

IPS-T63-10, Table 21

Explore a cross-section of Internet multicultural resources that have been critically parceled out for their effectiveness in promoting diversity education in the classroom.

K-12, Community College, University/College; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Using Ecolonization to Teach Environmental Education: Bridging the Gap

Kris Kleckner (MN)

IPS-T64-10, Table 17

Looking for something to grab your students' attention and keep them motivated to learn? Explore the potential of Ecolonization and Shockwave™.

General; Teachers, Postsecondary Educators, Coordinators

Using Student Web Presentations in Large-Enrollment College Courses

Matthew Laposata (GA)

IPS-T65-10, Table 22

Student Web presentations are a great way to integrate technology into college courses. But how do you use them in large classes? Find out here.

Community College, University/College; Teachers, Postsecondary Educators, Coordinators

Learning amid a Sea of Information in the New Millennium

James Levin (IL), Dan Kauwell (IL), Young-Jin Lee (IL), Daniel Schiff (IL)

IPS-T66-10, Table 24

The Internet has become a tremendous repository of information and holds much promise—but only if learners are provided the tools to make sense of it.

General; Teachers, Coordinators

Teaching Online: Trials and Tribulations, Sinkholes and Successes

Nancy McClure (WV)

IPS-T67-10, Table 16

This session details the steps taken to develop and teach online courses as well as to assess and compare resulting effectiveness of teaching and learning.

General, Community College, University/College; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Promoting Professional Development Online

Sharyl Nye (AL), Ann Henry (AL)

IPS-T68-10, Table 23

See a demonstration of online registration for professional development technology courses.

General; Coordinators

Get Tangled Up in the Web... Together!

Mary Robertson (KY), Jana Hickey (KY)

IPS-T69-10, Table 14

Learn about a new approach that gets staff members fired up about using WebQuests and online projects with their students!

K-12; Teachers, Coordinators

Please Steal This Idea: The K12 Internet Explorers Club

Therese Turman (GA), Craig Liggett (GA), Joan Brown (GA), Jeff Hansen, Ellen Freedman

IPS-T70-10, Table 13

The K12 Internet Explorers Club is a teacher-driven project designed to empower educators in classroom technology use and to mentor others in this process.

General, K-12, Community College, University/College; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Starship School: Creating Productive, Safe, Family-Oriented Educational Communities

Hazel Wagner (IL)

IPS-T71-10, Table 18

Technology is revolutionizing learning worlds. Learn how technology affects the thinking tools of disciplines (e.g., the scientific process) and supports integrated and independent self-directed learning.

K-8; Teachers, Teacher Educators, Coordinators

A Virtual Trip through the Civil Rights Movement

Elizabeth (Liza) Wilson (AL), Margaret Rice (AL), Beverly Ray (AL), B. Joyce Stallworth (AL), Kathy Shaver (AL), Kim Callison (AL)

IPS-T72-10, Table 20

Take a virtual trip through the Civil Rights movement while learning how to use technology for interdisciplinary teaching.

University/College, 6-12; Teachers, Teacher Educators, Coordinators

TUESDAY, 10:30-11:30 AM

SPOTLIGHTS

Igniting and Inviting Student (and Teacher) High Performance with Technology

Bobb Darnell, District 124, Arlington Heights (IL)

T002 **Room: Ballroom IV**

Discover how to help students become responsible, motivated, technologically literate learners. Learn how to explicitly teach students five powerful strategies that will develop their learning-to-learn skills and accelerate learning.

K-12; Teachers, Teacher Educators, Coordinators

Dancing on Quicksand: New Mindsets for the Information Age

Ian Jukes, Thornburg Center for Professional Development (Canada); Ted McCain (Canada)

T003 **Room: Ballroom I**

It's a brand new wild and wired world. However, educators and administrators have been ill prepared by an outmoded system. Learn what it will take to be successful in a brave new world where mindset will rival machines.

General; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Community, Communication, and Collaboration: Project-Based Learning on the Internet

Al Rogers, Lightspan Partnership, Inc. (CA)

T004 **Room: Ballroom II/III**

This multimedia presentation takes you beyond the common vision of the Internet as "library" or "delivery system" by showing examples of effective Internet use in schools.

General; Teachers, Teacher Educators, Coordinators

BEYOND THE CROSSROADS, WHERE DO WE GO FROM HERE?

Providing Web Support for Online and On-Campus Instruction

Daxing Chen (TX)

T005 **Room: 158W**

Web-based instruction is becoming an important teaching tool. Learn how to develop a systematic and progressive approach to support a wide range of Web-based learning activities.

General; Teachers, Coordinators

Georgia Learning Connections: We've Got Stuff!

Lisa Ciardulli (GA), Lynne Purcell (GA), Sheila Barnes (GA)

T006 **Room: 255W**

Visit a unique, online resource built by educators for educators. State standards are directly connected to Web links, lesson plans, and assessments to best facilitate learning.

K-12; Teachers, Teacher Educators, Coordinators

CONNECTING TECHNOLOGY TO TEACHING AND LEARNING

Instructional Strategies and Technology Integration

Tempting Techsational Tips

Tony Newland (IN), Phyllis Wilson (IN), Mary Jo Kinniman (IN)

T007 **Room: 361W**

Want to build student success? Been searching for practical strategies and effective ideas on integrating technology use across curriculum? Then this session is for you!

K-6; Teachers, Teacher Educators, Coordinators

Photography

Out of the Darkroom and into the Classroom with Computers

Leslie McGoey (LA), Denise Barnes (LA), Sandy Scott (LA)

T008 **Room: 364W**

Learn how to develop a high-school photography course using traditional 35mm cameras, digital photography, and darkroom techniques using the computer instead of a traditional darkroom.

General, 9-12; Teachers, Coordinators

Fostering Critical Thinking

"Blooming" Critical Thinkers for Tomorrow

Anne Davis (GA)

T009 **Room: 360W**

Unleash potential for lifelong learning by integrating current events, critical thinking, and technology. See Bloom's Taxonomy, Internet resources, and brain-compatible activities.

4-8; Teachers, Teacher Educators, Coordinators

Assessing Student Learning and Connecting to Standards and Assessment

Designing and Developing Standards-Based Electronic Portfolios

Helen Barrett (AK)

T010 **Room: 260W**

Take advantage of technology to bring new life into student portfolios. Learn how to design and develop a standards-based electronic portfolio using a variety of technology tools, including relational databases, hypermedia/presentation software, and Web-accessible hypermedia files.

General, K-12, Community College, University/College; Teachers, Teacher Educators, Postsecondary Educators

Laptops

Laptops Level the Score for Urban Learners

Linda Gutterman (NY), Brian Morrow (NY), Gladys DelliPizzi (NY), Christine Mulgrave (NY), Steve Jaffe (NY), Brenda Mercado (NY)

T011 **Room: 261W**

In a world where competition for jobs will be fierce, Community School District Six finds that laptops level the playing field for inner-city students.

4-12; Teachers, Coordinators

Preschool and Elementary

Connecting Fun and Educational Technology Activities with the K-5 Curriculum

Diane Judd (FL), Inez Heath

T012 **Room: 363W**

See demonstrations, examples, and discussion of ways to enhance learning by integrating technology into the K-5 curriculum using a constructivist approach.

University/College, K-6, teachers, Teacher Educators, Coordinators

Language Arts

An Odyssey through Technology in the English Class

Linda Babb (SC), Jo Lynn Allen (SC), Teresa Bromley, Paula Duncan, Judith Parham

T013 **Room: 257W**

An English teacher uses teamwork to help freshmen read, analyze, and synthesize Homer's Odyssey through a multimedia computer project. (Win the war waged by state standards without using a Trojan horse.)

9-12; Teachers

Math and Science

Students Blast Off: A Collaborative Learning Mission

Ann McGlone (WA)

T014 **Room: 166W**

Learn about an exciting educational experience that enables students across the country to explore space survival and to collaboratively experience all aspects of building a space community.

General, K-12, K-8; Teachers, Teacher Educators, Coordinators

Special Needs and Assistive Technology

Technology Solutions That Work in the Academic Areas

Scott Marfilius (WI), Diane Rozanski (WI)

T014a **Room: 156W**

During this session, you'll take a closer look at software programs that have been successful in assisting students who are struggling with reading, writing and arithmetic.

General; Teachers, Teacher Educators, Postsecondary Educators

Computer Science

Star Trek and Beyond: Ethics and Social Impact

C. Dianne Martin (VA)

T015 **Room: 366W**

Science fiction is more than just popular entertainment; it can also be a tool to illustrate ethical issues in a technology-driven society. Class exercises, case studies, and resources will be shared. (Sponsored by SIGCAS)

K-12, Community College, University/College; Teachers

Internet/Web

WebCT: From Implementation to Success

Carolyn Gard (GA)

T016 **Room: 160W**

Support is a critical component of a successful Web-based instructional technology program. Learn about Georgia State University's support network for its WebCT courses.

Community College, University/College, 9-12; Postsecondary Educators, Coordinators

Multimedia

Turn Teens and Teachers on to Technology with HyperStudio'

Lisa Boyd (AL)

T017 **Room: 369W**

Discover exciting, easy ways to incorporate HyperStudio into your lesson plans across the curriculum. See examples of technology incorporation in history projects.

4-12; Teachers, Coordinators

Funding, Planning, and Implementation

Schools Interoperability Framework

Patrick Plant (MN), Barbara Andrepont,
Javier Perez-Sanchez, Sue Kamp (DC)

T018 **Room: 157W**

Learn about the "Schools Interoperability Framework" and current pilot schools. This new initiative uses XML (Extensible Markup Language) to solve a daunting education problem—how to share and report data across all K-12 administrative and curriculum applications.

K-12, General; Coordinators, teachers

Tips for New Computer Coordinators

Richard Smith (TX), Anthony Sassi (TX)

T019 **Room: 256W**

In this session, two highly experienced instructional technology directors will share what they have learned about implementing technology into the classroom and working within and around the system to achieve that goal.

K-12; Coordinators

Research

Brain-Based Research and Technologies: A Natural Fit?

David Williams (IN), Margot Williams (IN)

T020 **Room: 254W**

See how it fits! Explore the latest brain-based research and how instructional technologies can complement methods and strategies for learning.

General, K-12, Community College, University/College; Teachers, Teacher Educators, Postsecondary Educators

Staff Development

The ITLP Program

Steve Baule (IL), Karen Arenson (IL)

T021 **Room: 267W**

Learn about the Individual Technology Learning Plan (ITLP) program, which pairs teachers with mentors to help them develop new technology skills and integrating them into their classrooms.

General; Teachers, Teacher Educators, Coordinators

4001: A Cyberspace Odyssey

Linda Dickeson (NE)

T022 **Room: 264W**

Learn how a large school district created more than 4,000 independent Internet users. Topics include innovative training, a comprehensive Web site, online staff development, and customized software CDs.

General; Teachers, Coordinators

Preservice and Graduate Teacher Education

Collaborative Teacher Education: An Online Case Study Shared Across Universities with Preservice Teachers

Cheryl Mason (VA), Kara Dawson (FL)

T023 **Room: 268W**

Find out how the presenters developed a cohort of social studies educators through online professional discourse with colleagues in geographically disparate locations.

General; Teachers, Teacher Educators, Coordinators

Preparing the Professors: Issues in Educational-Technology Doctoral Programs

Diane McGrath (KS), Trudy Abramson (FL),
Arlene Borthwick (IL), Marianne Handler (IL),
Ann Thompson (IA), Leigh Zeitz (IA)

T024 **Room: 269W**

Educational-technology graduate faculty will lead a conversation focused on the challenges and future visions related to the design of educational-technology doctoral programs. (Sponsored by ISTE's SIGTE)

General, University/College; Teachers, Teacher Educators, Postsecondary Educators

Creating a Culture That Supports Online Instruction

Catherine Thurston (IL), Gregory Waddoups (UT)

T025 **Room: 368W**

Learn about organizational structures, equipment, incentives, professional development opportunities, and technical support that optimize efforts in online course development.

General, Teacher Educators, Postsecondary Educators

MOVING BEYOND THE CROSSROADS: TEACHERS AS AGENTS OF CHANGE

Cultivating Powerful Visions of Classroom Integration

Peggy Ertmer (IN), Sangeetha Gopalakrishnan (IN), Eva Ross (IN)

T026 **Room: 165W**

Find out how one elementary-, one middle-, and one high-school teacher integrated classroom technology. Their stories are conveyed on a CD-ROM that allows one to easily compare their findings.

K-12, Community College, University/College; Teachers, Coordinators

CONNECTED COMMUNITIES: SCHOOLS, BUSINESSES, AND RESOURCES

Innovative, Green, and Free! ETCEP: The Alternative to Technology Funding

Lauren Bonica (NJ), David Steffens (NJ)

T027 **Room: 362W**

Start collecting empty laser and inkjet cartridges today! Discover how thousands of schools are earning free computer technology through Educational Technology & Conservation Exchange Program (ETCEP). (Exhibitor presentation)

K-12; Teachers, Coordinators

Picture This Century: An Interactive, Interdisciplinary Learning Experience

Sue Kidera (NY), John Schiess (NY), Carole Schwab (NY), Barbara Manchee (NY)

T028 **Room: 161W**

Learn about Picture This Century, an exciting and fun interdisciplinary project in which students create an interactive Web site through cooperative learning, community partnerships, and professional development.

General, Community College, University/College, 4-8; Teachers, Teacher Educators, Coordinators

TUESDAY, 12 NOON–1 PM

SPOTLIGHTS

Integrating Technology into Teacher Education – One Syllabus at a Time

Donna Baumbach, University of Central Florida; Gail West (FL); Mary Bird (FL)

T029 **Room: Ballroom II/III**

Presenting the design and results of the SEIR•TEC/SUNRAY Higher Education Institutes that focused on integrating technology into teacher education programs through modeling and online and hands-on activities.

University/College; Coordinators, Teacher Educators

Using Immersive Virtual Worlds in Real-World Classrooms

Chris Dede, George Mason University (VA); Debra Sprague (VA); Theresa Siggins (VA); Elisa Kelley (VA); R. Bowen Loftin (TX)

T030 **Room: Ballroom IV**

When high-end virtual reality systems are placed in elementary and secondary classrooms, students learn science more effectively. We'll discuss educational outcomes and their implications for the future.

General; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Technology Training for 5,000 Teachers: The Intel® ACE and Power to Teach Programs

Robert Nolan, Institute of Computer Technology (CA); Kathy O'Neill; Kim Mulkey; Dan McBride; Dave Murdock; Paige Kuni; Jennifer Doherty

T031 **Room: Ballroom I**

Learn what it takes to educate classroom teachers to integrate technology into their existing curriculum to help students increase their learning and achievement. In these two programs, foundations, high-tech corporations, and universities have partnered to offer hands-on technology training in 11 states and the District of Columbia.

K–12; Teachers, Teacher Educators, Coordinators

BEYOND THE CROSSROADS, WHERE DO WE GO FROM HERE?

Making a Difference: New Tools for a Timeless Purpose

Lynell Burmark (CA), Lou Fournier (CA)

T032 **Room: 255W**

The future of education is rushing headlong back to the heart. Learn how to reach the toughest kids through technology and a visionary approach.

General, K–12; Teachers, Teacher Educators, Postsecondary Educators

Expand Learning Possibilities: Internet Computing by the LearningStation.com

Craig Larsen (NC), Burl Hogins (NC), Dale Mann

T033 **Room: 362W**

Through software rental and thin-client computing, the LearningStation.com provides unique solutions to the difficulties of acquiring and maintaining the latest in computers and software.
(Exhibitor presentation)

K–12; Teachers, Postsecondary Educators, Coordinators

DISTANCE LEARNING

Electronic Delivery of High-School Courses: Status, Trends, and Issues

William Thomas (GA)

T034 **Room: 368W**

Are Web-based courses for high-school students the long-sought "silver bullet" that will meet student academic needs? This presentation addresses some of the important policy, instructional, and management issues.

K–12, Community College, University/College; Teachers, Postsecondary Educators, Coordinators

CONNECTING TECHNOLOGY TO TEACHING AND LEARNING

Instructional Strategies

Creativity Extravaganza! Throwing Mud Pies in the Face of Tradition

John Perry (MS), Larry Anderson (MS), Andy Carvin (DC), Chip Daley (NV), Peter Reynolds (MA)

T035 **Room: 361W**

Break out of your traditional mold! Enjoy a bevy of fun as experts reveal successful strategies that enable everyone to teach creatively with technologies.

General; Teachers, Teacher Educators, Postsecondary Educators

Changing the Questions: Students, Information Literacy, and the Web

Joyce Valenza (PA), Michael Wagman (PA)

T036 **Room: 364W**

This session will offer insight on how librarians and teachers can work together to change the questions they ask their students and to inspire their students to use information more meaningfully.

K–12; Teachers, Coordinators

Fostering Critical Thinking

Heads Up: Automated Capture, Integration, and Access in the Classroom

Meghan Burke (GA), Gregory Abowd (GA)

T037 **Room: 158W**

Automated capture is negating the need for classroom note taking, allowing students to focus more on the essence of discussions and classroom instruction.

Community College, University/College; Postsecondary Educators, Coordinators

The Adventure Agent Technology Club

Janet Johnson (GA)

T038 **Room: 360W**

Learn how our students make an "adventure" out of technology integration as they conduct fact-finding missions and presentations using available technology in their schools.

4–8; Teachers

Assessing Student Learning and Connecting to Standards and Assessment

Evaluating the Effects of Technology Projects: Challenges and Approaches

Vera Uyehara (ND), Terri Austin (IN), Coy Isen (UT)

T039 **Room: 254W**

The quest for evaluation lies at the heart of every new initiative. Several U.S. Department of Education Technology Innovation Challenge Grant projects share "lessons learned" in designing evaluation methods and outcome analyses.

General; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Language Arts

Integrating Technology into Elementary Language Arts

Debbie Griswold (CA)

T040 **Room: 257W**

Get proven ideas and helpful hints for successfully integrating technology into the existing language arts curriculum. Leave with a list of useful resources and Web sites.

4–8; Teachers

Math and Science

Exciting Teaching Adventures in Science with National Geographic Materials

Kathryn Bailey (GA)

T041 **Room: 166W**

Think quality and variety! Using a combination of print and technology-based materials, upper-elementary and middle-school teachers are creating terrific science-based and cross-curricular teaching units.

4–8; Teachers, Teacher Educators, Coordinators

Are Your Students Ready for Algebra I? Technology Can Help!

Robyn Silbey (MD)

T042 **Room: 260W**

Students succeed with a comprehensive, customizable middle-school math software program correlated to national standards. It addresses multiple intelligences as it diagnoses, prescribes, teaches, and assesses.

6–8; Teachers, Coordinators

Computer Science

Teaching Computer Programming Concepts Using Visual Basic'

Beth Brown (FL)

T043 **Room: 363W**

High school instructor and author of *An Introduction to Programming Using Microsoft Visual Basic* presents techniques for using Visual Basic to teach computer programming concepts.

Community College, University/College, 9–12; Teachers, Postsecondary Educators, Coordinators

Beowulf in High-School Computer Science

Cheri Burch (NM), Pacha Kaye (NM)

T044 **Room: 366W**

Beowulf entered our high-school computer science curriculum when students embraced a group project building a supercomputer from a cluster of parallel, low-cost, off-the-shelf processors.

9–12; Teachers, Teacher Educators

Internet/Web

SCR*TEC Presents: How the Internet Works- An Overview

Douglas Adams (KS)

T045 **Room: 160W**

Ever wonder how the Internet came about? Learn the answer to that question and many more in this introductory session. You'll also learn the basics of networks and TCP/IP, routers, domains, and e-mail.

General; Teachers, Teacher Educators, Postsecondary Educators

Tips, Tricks, and Techniques: Teaching Educational Computer Technology Online

Laura Turner (SD)

T046 **Room: 157W**

Learn online educational technology teaching techniques that work. We will be employing WebCT and following ISTE standards. Software addressed: Office 97/2000, Windows® NT®, Netscape® Composer®, AppleWorks® (formerly ClarisWorks), and HyperStudio®.

K-12, Community College, University/College; Teachers, Teacher Educators, Postsecondary Educators

Funding, Planning, and Implementation

Farragut Connected for Learning: Educational Foundation, Partnerships, Grants, and Funding

Bill Parker (TN), Lovada Ferguson (TN)

T047 **Room: 261W**

Find out how one high school partnered with local businesses, government, and higher education to help fund its technology needs. We will also look at grants and other sources of funding.

K–12; Teachers, Coordinators

Evaluation

Using Data to Plan and Assess the Effects of Technology

Bonnie Brownstein (NY), Tim Best (OH), Todd Hellman (OH)

T048 **Room: 256W**

Learn about a case study of an Ohio effort to capture appropriate data for planning and assessment. The online instruments will be examined and results presented.

K–12, Community College, University/College; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

STAYING CONNECTED WITH PROFESSIONAL DEVELOPMENT

Computer Applications for School Administrators

John Thompson (NY)

T049 **Room: 156W**

School administrators need to "walk the talk" in using computer applications to improve job performance. Get a solid overview of using computer technology in everyday administrative processes.

K–12; Coordinators

Staff Development

Empowering Teachers through a Technology Integration Academy

Karin Porter (TX), Barbara Hunt (TX), LaDonna Conner (TX), Jan Jaeger (TX)

T050 **Room: 267W**

Because of limited support, time, and training, technology integration often is slow to develop. Learn about one possible solution to this problem.

K–6; Teachers, Teacher Educators, Coordinators

Professional Development- A Comprehensive Approach

Lydotta Taylor (WV)

T051 **Room: 264W**

From a nonprofit education organization that has trained more than 5,000 educators and community members in West Virginia, learn step-by-step how to build training programs and develop tools to assist teachers in enhancing classroom instruction through technology.

General; Teachers, Postsecondary Educators, Coordinators

Preservice and Graduate Teacher Education

Jericho: University, Public Schools, and State Department- Future Teachers' Technology Training

William (Bill) Fisk (SC), Lynn Nolan (SC)

T052 **Room: 269W**

K–16 innovation teams (language arts, science, math, social studies) match up technology skills and applications with state-mandated curriculum and develop technology-rich units for preservice teacher content, methods, and field experience classes.

K–12, University/College; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Preservice Professional Portfolios Using State and National Standards

Kristie Walsdorf (FL), Susan Lynn (FL)

T053 **Room: 268W**

Investigate strategies for implementing online portfolios using state and national standards as well as techniques for teacher educators to assess preservice teacher progress.

K–12, Community College, University/College; Teachers, Teacher Educators, Postsecondary Educators

STANDARDS, ASSESSMENT, AND ACCOUNTABILITY: STAYING CONNECTED

Technology and Teachers: Assessing Competencies, Assessing Programs

Lajeane Thomas (LA), Peggy Kelly (CA), Leslie Conery (OR)

T054 **Room: 369W**

Following an overview of the extended four-phase NETS project by Project Director Lajeane Thomas, participants will review and suggest enhancements to proposed assessment strategies and tools. This session provides attendees the opportunity to examine draft assessment strategies and instruments and to provide formative review in this important endeavor.

K–12, University/College; Teacher Educators, Coordinators

CONCURRENT SESSIONS

TUESDAY, 12 NOON–1 PM, CONT.

MOVING BEYOND THE CROSSROADS: TEACHERS AS AGENTS OF CHANGE

Fermilab LInC: Online Leadership Development Strategies for Technology-Supported Constructivist Learning

Laura Mengel (IL), Sharon Gatz (IL), Stephen Meehan (IL)

T055 **Room: 165W**

Learn strategies developed over the past six years to foster constructivist learning and technology integration, facilitate national online and face-to-face professional development, and create leadership teams.

K-12, University/College: Teachers, Teacher Educators, Postsecondary Educators, Coordinators

CONNECTED COMMUNITIES: SCHOOLS, BUSINESSES, AND RESOURCES

Virtual Museum Projects to Reclaim and Preserve Native Cultures

Paul Resta (TX), Shelly Valdez (NM), Marty de Montano (NY), Mark Christal (TX)

T056 **Room: 161W**

A model of school and museum collaboration and culturally responsive curriculum is applied to the goal of preserving endangered Native American cultures.

General: Teachers, Postsecondary Educators

TUESDAY, 1:30–2:30 PM

SPOTLIGHTS

Human Motion, Mechanical Physics, Videography, and Animation: How the Science of Biomechanics Uses the Power of Today's Computer Workstation

Ben Johnson, Georgia State University

T057 **Room: Ballroom IV**

Real-world examples of biomechanical analyses performed on Olympic and professional athletes, disabled athletes, the use of canes by the visually impaired, and workers performing occupational tasks will be presented. The science of biomechanics has great potential for influencing the delivery of mathematics, physics, and biological principles to today's middle and high school student.

6-12: Teachers, Teacher Educators

Meeting Standards for Staff Development: Ensuring Quality

Joellen Killion, National Staff Development Council (CO)

T058 **Room: Ballroom II/III**

Review the National Staff Development Council's Standards for Staff Development with a member of the Council's staff. Discuss how these standards relate to technology staff development.

K-12: Coordinators

Beyond Technology to the New Literacy

Ted McCain, Thornburg Center for Professional Development (Canada), Ian Jukes (Canada)

T059 **Room: Ballroom I**

Learn how we can integrate critical thinking, problem solving, information literacy, the principals of graphical design, and a myriad of other 21st century skills into the learning environment.

General: Teachers

BEYOND THE CROSSROADS, WHERE DO WE GO FROM HERE?

Conversations on New Visions in Educational Technology

Margo Nanny (CA), Henry Olds (MA)

T060 **Room: 255W**

Join education leaders to discuss key issues. Choose from Equity Issues, Research & Assessment, Creativity, Upgrading the Teaching Profession, and Quality Content for Future Media.

General, K-12: Teachers, Teacher Educators, Postsecondary Educators, Coordinators

MarcoPolo: Setting the Agenda for a New Discipline

Caleb Schutz (VA), Caleb Schutz (VA)

T061 **Room: 362W**

Using partnerships with leading educational organizations, MarcoPolo provides safe and credible Internet content and professional development to K-12 teachers throughout the United States at no cost.
(Exhibitor presentation)

K-12, Community College, University/College: Teachers, Teacher Educators, Postsecondary Educators, Coordinators

DISTANCE LEARNING

Balancing Face-to-Face and Online Experiences in Higher Education

Marsha Burmeister (FL), Charles Schlosser (FL)

T062 **Room: 368W**

The best of both worlds: a critical examination of the role of face-to-face instruction within the context of distance-delivered courses in higher education.

General, Community College, University/College: Teachers, Teacher Educators, Postsecondary Educators

Prescriptions for Behavior Modification to Improve Success in Distance Learning

Cordelia Twomey (NJ), Trudy Abramson (FL)

T063 **Room: 158W**

Teachers in distance learning programs will learn to identify predictors for student success and ways to help students modify their behaviors. This session will look at the learner, the technology, and the curriculum design; the possible barriers to student success; and ways to enhance student success.

General: Teachers, Teacher Educators, Postsecondary Educators

CONNECTING TECHNOLOGY TO TEACHING AND LEARNING

Instructional Strategies and Technology Integration

Technology Projects That Make It Home!

Christopher Curchy (FL), Keith Kyker (FL)

T064 **Room: 361W**

Explore technology-based lessons and projects that are recorded in a format that students can easily take home and share with their parents. Seeing is believing.

General, K-12: Teachers, Teacher Educators, Coordinators

Music

Music Education after 1999

Duane Duxbury (WA)

T065 **Room: 364W**

Get a close look at a MIDI environment where students learn music theory and keyboard skills for the purpose of writing music.

4-12: Teachers, Coordinators

Technology Education

Farragut Connected for Learning: Cisco Networking Academy

Daniel Waters (TN), Bill Parker (TN)

T066 **Room: 157W**

Take a closer look at the Cisco Networking Academy, a technology-based curriculum course for teaching students about computer networks. Thanks to the academy, students are receiving a general education as well as preparation for the workforce.

Community College, University/College, 9-12: Teachers, Coordinators

Fostering Critical Thinking

Energized, Paperless Research Projects

James O'Neill (IL), Carleen Smith (IL)

T067 **Room: 360W**

Give your students a new challenge. Instead of having them write a research paper, have them create Web pages or slideshow presentations. They'll become active researchers, publishers, and presenters.

9-12: Teachers, Coordinators

Laptops

Anywhere Now Learning: Universal Laptop Initiative

J. David Martin (VA), Janet Copenhaver (VA)

T068 **Room: 369W**

The governmental and educational systems in Henry County, Virginia, are providing more than 6,000 laptops for home and school use to students in Grades 4-12. Hear how this group overcame obstacles, how it received funding, and how the learning process changed as a result.

General; Teachers, Teacher Educators, Coordinators

Language Arts

These Are the Days of Their Lives: Students' Author Presentations

Michael Lyons (GA), Louise Scott (GA)

T069 **Room: 257W**

Join this entertaining and motivating session that combines reading, Web-based research, and computer technology. It also includes examples of student-produced PowerPoint® presentations of authors and books.

4-8; Teachers, Teacher Educators, Coordinators

Math and Science

Problem Solving Our Way Back into Math

Pauline Bresnahan (WA), Nancy Wolfrum (WA)

T070 **Room: 254W**

What do you get when you combine staff development, technology, and math? Teachers who are ready to approach their math instruction in a new way.

General, 4-8; Teachers, Coordinators

SeaTrek: Implementation of Telementors in Middle-School Science

Mike Horan (FL), Barbara Kirkpatrick (FL)

T071 **Room: 166W**

Find out how the middle-school science curriculum in Sarasota, Florida, was enhanced with the implementation of a telementoring program linking scientists with students to promote student scientific inquiry.

4-12; Teachers, Coordinators

NASA Glenn Distance Learning Program

Ruth Petersen (OH)

T072 **Room: 260W**

Your students can get the scoop on current NASA research from the researchers and engineers themselves. Take virtual tours of NASA facilities through videoconferencing technologies.

General, K-12; Teachers, Teacher Educators, Coordinators

Computer Science

Cognitive Assessment of Students' Problem-Solving and Programming Skills

Fadi Deek (NJ)

T073 **Room: 366W**

Find out about an assessment method devised for measuring students' problem-solving and program development skills, knowledge perception, attitudes, and motivation toward problem solving and programming.

9-12, University/College, Community College; Teachers, Teacher Educators, Postsecondary Educators

Special Needs and Assistive Technology

Computer-Based Literacy Training for Adolescents and Adults

Judy Nantau (IL)

T074 **Room: 363W**

Explore the scientific theories, principles, and training components of teaching phonological awareness, auditory processing, and decoding skills using computer-based training. (Exhibitor presentation)

Community College, 6-12; Teachers

Internet/Web

HyperInternet: Creating Interactive Internet Activities

Jim Hirsch (TX)

T075 **Room: 160W**

Experience how the Internet can be a more integral part of student-centered classrooms. Learn how to use HyperStudio® as an authoring tool to create a wide variety of activities that can be accessed on the Internet for student use at school and home.

K-12; Teachers, Coordinators

Support and Maintenance

Real Help for the Help Desk: Students in Charge

Barbara Barr (KY), Charlanne Pook (KY)

T076 **Room: 261W**

Johnny's computer doesn't boot! The bookkeeper's balance doesn't compute! How do you keep computers humming on a shoestring? We put the students in charge!

General; Teachers, Postsecondary Educators, Coordinators

Evaluation

Beyond Standards: What We Are Learning from Conducting TechAudits

Helen Stukola Jancich (IN), Howard Mehinger (IN)

T077 **Room: 256W**

Learn how Phi Delta Kappa and the Indiana University Center for Research on Technology and Learning launched TechAudits to provide consulting to school districts.

General, K-12, University/College; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

STAYING CONNECTED WITH PROFESSIONAL DEVELOPMENT

Build Leadership Capacity and Strong Technology Programs

Linda Valenzuela (FL)

T078 **Room: 156W**

Leadership is the most important factor affecting the successful integration of technology. Discover the skills and knowledge needed to build personal and organizational leadership capacity.

K-12; Teachers, Coordinators

Staff Development

Evaluating Preservice Teacher Education Students' Technology Competence and Confidence

Natalie Milman (VA), Philip Molebash (VA)

T079 **Room: 267W**

Reports suggest that preservice teacher education students are inadequately prepared to effectively integrate technology into their future classrooms. Find out how universities are addressing these challenges.

University/College; Teacher Educators, Coordinators

Learning to Fish: A Staff Development Model for Self-Sufficiency

Sandy Paben (NY), Jackie LaRose (NY)

T080 **Room: 264W**

This session will show you a unique staff development model that has changed the way teachers of all levels teach and students learn. It includes a support network for teacher follow-up.

General; Teachers, Coordinators

Preservice and Graduate Teacher Education

Integrating Technology into Preservice Teacher Instruction: A Collaborative Model

Mary Kolesinski (FL), Dana Fredebaugh (FL), Denise Callwood-Brathwaite (FL), Peter Watson (MA), Margaret McDaniels (FL)

T081 **Room: 268W**

Representatives of various sectors of the educational community present different perspectives on a collaborative project being funded, in part, by a U.S. Department of Education's Preparing Tomorrow's Teachers to Use Technology (PT^3) Grant.

University/College, K-6; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

TUESDAY, 1:30-2:30 PM, CONT.

Preparing Tomorrow's Teachers for Diversity-Responsive, Technology-Rich Learning

Kevin Rocap (CA), Maria Quezada (CA)

T082 **Room: 269W**

Learn about the Equity through Distributed Education Network, an online clearinghouse and virtual world providing professional development resources for preservice and inservice teachers.

K-12: Teachers, Teacher Educators, Postsecondary Educators, Coordinators

MOVING BEYOND THE CROSSROADS: TEACHERS AS AGENTS OF CHANGE

Multimedia Mania: Classroom Models of Technology Infusion

Caroline McCullen (NC), Paolo Williams (HI)

T083 **Room: 165W**

See winning projects from the international multimedia competition. Learn classroom tips, multimedia techniques, and integration strategies from teachers at all levels. (Sponsored by ISTE's HyperSIG)

General, K-12: Teachers, Teacher Educators, Coordinators

CONNECTED COMMUNITIES: SCHOOLS, BUSINESSES, AND RESOURCES

NSF Funding Opportunities for High School and Undergraduate Computer Science, Math, and Science Faculty

Harriet Taylor (VA), Dianne Martin (VA), Michael Haney (VA)

T084 **Room: 161W**

Don't miss this opportunity! National Science Foundation program directors will discuss funding opportunities and exemplary projects for computer science, mathematics, and science high school and undergraduate faculty.

9-12: Teachers, Teacher Educators, Postsecondary Educators, Coordinators

TUESDAY, 1:30-3:30 PM

STUDENT SHOWCASE

Located on Level 2, opposite Room 265W.

Using Technology to Connect Students with the Community

Cindy Henderson, Pelham Road Elementary School (SC), with students Jennifer Pickens, Barbara Turner, Ellen Goldman

Elementary students describe and demonstrate the CD they designed, compiled, and created to spotlight the various facets of their community.

General, K-6: Teachers, Teacher Educators, Coordinators

Student Support Team to the Rescue

Patrick Hlavaty, Brumby Elementary School (GA), with students Caroline St. John, Louis Lim, Kyle Manthe, Handa Yang

Meet students helping teachers load programs, instruct students for peer-to-peer teaching and learning, and help monitor computer labs.

K-6, Teachers

Under the Sea with Technology

Karen Roark, Whitfield County Schools (GA), with students Joshua Ellis, April Kinsey, Emily Manis, Sarah Manis, Emily Rush, Joshua Tucker, Molly Tucker, Susan Williams

Join us to find the answers to "Do dolphins surf the Web?" and "Can a whale e-mail?" as well as to track the message in the bottle and graph the ocean floor. Come see Save Our Oceans, a multimedia presentation and hidden treasure search.

K-12, teachers

Preservice Teachers' Technology Integration: Lessons from a PDS

B. Joyce Stallworth, The University of Alabama, with students Elizabeth Wilson, Kim Callison, Kathy Shaver, Margaret Rice

See IT activities used by preservice teachers in a middle-school language arts class and lesson plans used at a professional development school (PDS).

University/College, 6-12: Teachers, Teacher Educators, Coordinators

POSTERS

All posters take place in Room 367W.

The Woodcliff School Travel Agency: Travel Projects by Students

Sharon Andelora (NJ)

PS-T73-1:30, Table 12

After learning word processing, databases, and drawing, elementary- and middle-school students complete a travel project that includes an itinerary, maps, and databases of restaurants, hotels, places of interest, and Web sites.

K-12: Teachers, Coordinators

Let's Make It Real: Meaningful Integration for a New Millennium

Lisl Behrend (SC), Anna Marie Bentfeld (SC), Libby Pressley (SC), Jeanie Eskew (SC)

PS-T74-1:30, Table 4

Four primary-level teachers share successful strategies, lesson plans, and software for the integrating of technology into curriculum. Student work and projects are displayed.

K-3: Teachers, Teacher Educators, Postsecondary Educators, Coordinators

How to Create an Internet Course in 10 Easy Steps

Susan Buchholz (GA), Deborah Huntley (GA), Brenda Cherry (GA)

PS-T75-1:30, Table 1

Find out how we faced the challenges of creating a Web-based course. What did we learn? What would we have done differently?

Community College, University/College: Teachers

Guiding New Teachers "Beyond 2000"

Raymond Fehr (KY), Nancy Hack (KY), Rita Greer (KY)

PS-T76-1:30, Table 2

The new millennium has arrived in the Jefferson County Public Schools. See the interactive CD used in new teacher induction.

General: Teachers, Teacher Educators, Coordinators

Lighten Up! Color, Light, Optics, and Photography at Shutesbury Elementary

Carol Holzberg (MA), Bonnie Roy (MA), Ken Lindsay (MA), Jessica Harris (MA)

PS-T77-1:30, Table 5

See how Shutesbury Elementary kindergartners and fourth graders used computers, digital cameras, and Internet research to conduct scientific investigations of color, light, and vision.

General, K-12: Teachers, Coordinators

Assessing Immediate and Long-Term Benefits of Interactive Studio Physics

Michael Kalsher (NY), Holly Traver (NY)

PS-T78-1:30, Table 8

A study reveals that interactive courses do not produce better grade performance than lecture courses. However, students find interactive course collaboration beneficial for modeling real-world teamwork.

General, University/College: Teachers, Coordinators

SATEC: Integrating Mathematics and Technology

Thomas Ledvorowski (TX), Andrew Sorensen (TX)

PS-T79-1:30, Table 9

Learn how teachers are helping students build mathematical concepts through the use of video imaging, data collection tools, spreadsheet software, and other technologies.

6-12: Teachers, Teacher Educators, Coordinators, Postsecondary Educators

Integrating Technology for the Needs of High-Achieving or Gifted Students

Lucia Mitchell (NJ), Gailen Mitchell (NJ)

PS-T80-1:30, Table 3

Technology is a wonderful vehicle for meeting the needs of high-achieving and gifted students. Learn what is available and what will work for you!

K–8; Teachers, Teacher Educators, Coordinators

CyberGreening:
Technology and Environmental Education in the Urban School

Holly Shaw (PA), Valerie Adams (PA)

PS-T81-1:30, Table 10

We will share a comprehensive environmental project for middle schoolers that includes creating and maintaining an urban garden and using technological tools to enhance project-related presentations.

6–8; Teachers, Coordinators

Fine Art + Technology:
Motivating Student Learning in Art Classrooms by Integrating CD-ROMs and the Internet

Yan Sun (OH)

PS-T82-1:30, Table 6

Discover ways to encourage active learning in fine art classrooms using a multimedia CD and the Internet. Hear integration tips to ensure effectiveness.

General, Community College, University/College, 9–12; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

The Digital Camera and Its Uses in the Classroom

Andy Ventress (IL)

PS-T83-1:30, Table 11

Learn how best to use the digital camera (Casio QV8000SX) in your classroom. Take home handouts with sample activities.

General; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Little Village to Global Village

Marlene Woytonik (IL), Sue Sherman (IL)

PS-T84-1:30, Table 7

Discover how to plan and implement a multidisciplinary project in which students investigate the historical and cultural background of their communities.

K–12; Teachers, Teacher Educators, Coordinators

WEB POSTERS

All posters take place in Room 367W.

Creative Use of Cyberspace:
Training Teachers for Inclusion

Robin Barton (GA), Mikki Garcia (GA), Kim Simshauser (GA)

IPS-T85-1:30, Table 18

Learn what goes into the development and use of online, multimedia modules for a Web-based course: Teaching and the Exceptional Child. The course addresses instructional strategies and special education law.

General, Community College, University/College; Teachers, Teacher Educators, Postsecondary Educators

Creating a Media Center Home Page

Shu-Hsien Chen (GA), Leticia Ekhami (GA)

IPS-T86-1:30, Table 19

Visit a middle-school media center home page. Hear the presenters' experiences designing it.

General, K–12; Coordinators

Digital Bridges: The K-12 Videoconferencing Web Resource for Teachers & Planners

Kirk deFord (OR)

IPS-T87-1:30, Table 17

Visit the Digital Bridges Web Site and learn about the content and the basis for this interactive and planning Web resource.

General, K–12; Teachers, Teacher Educators, Coordinators

CNN Student Bureau: Kids, Cameras, and Computers-Real-World Classroom Experiences

Sherri Garrett (GA), Alan Duke (GA)

IPS-T88-1:30, Table 20

The CNN Student Bureau Web site puts authentic learning experiences in students' hands. Gain hands-on experiences in writing, editing, and producing for a global audience.

Community College, University/College, 9–12; Teachers, Postsecondary Educators, Coordinators

Using a Class Web Site to Teach, Manage, and Motivate

Roderick Hames (GA)

IPS-T89-1:30, Table 14

Learn ways to fully integrate a class Web site into your current curriculum and to facilitate your professional growth needs.

4–12; Teachers, Teacher Educators, Coordinators

42eXplore:
An Approach to Internet Integration

Larry Johnson (TX), Annette Lamb (TX)

IPS-T91-1:30, Table 13

Each week 42eXplore (http://eduscapes.com/42explore) focuses on an interesting topic, at least four supplementary Web site starting points, and lots of technology integration activities. Come explore!

General, K–12, Community College, University/College; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Technology for General Physics Courses

Gene Kuleshov (NY), Helene Bergman (NY), Issac Herskowitz (NY)

IPS-T92-1:30, Table 15

The Web Course in the Box provides access to a wide range of resources: animated illustration software, virtual labs, computerized tests, and Web link tutorials.

University/College, Teachers, Coordinators

Integrating Technology with Standards in Mind:
A Preservice Approach

Susan Ridout (IN), Jane Riehl, Carl deGraaf

IPS-T93-1:30, Table 16

Teacher education students are effectively creating technologically rich language arts units based on newly adopted standards.

General; Teachers, Teacher Educators

What Is under the Covers of an Online Course?

Stan Silverman (NY), Gene Silverman (NY)

IPS-T94-1:30, Table 24

View the guts of an online course for teachers. See e-lectures, assignment rubrics, team activities, and student evaluations.

General; Teachers, Teacher Educators, Postsecondary Educators

Montclair Learning Interchange:
Where Teachers Create Content and Share Resources

Paul Tarantiles (NJ), Maria Narciso (NJ), Samantha Morra (NJ), Lois Tannous (NJ)

IPS-T95-1:30, Table 23

Visit the Montclair Learning Interchange (http://mli.montclair.k12.nj.us), where teachers post projects and share Internet resources. The site can also be used as a staff development tool!

K–12; Teachers, Teacher Educators, Coordinators

Using Internet Technology as a Tool for Assessment and Reflection

Mary Richards (ME)

IPS-T96-1:30, Table 22

Maine school districts are using the Internet to assess student performance on key state standards. See how this process works and hear the benefits described by participants.

K–12; Teachers, Teacher Educators, Coordinators

Developing and Integrating Web-Based Resources for Curricular Support

Kesheng Yu (NY)

IPS-T96a-1:30, Table 21

The goal of the curricular support group is to provide faculty members with the technology, tools, and support needed to enhance the curriculum.

General, University/College; Postsecondary Educators, Coordinators

TUESDAY, 3–4 PM

SPOTLIGHTS

NetSchools- Transforming Education

Tom Greaves, NetSchools Corporation (CA)

T085 **Room: Ballroom II/III**

The Study Pro laptop enables every student to have continuous broadband access to the Internet. Find out how connecting teachers and students to the Web, their parents and the community can generate A's in achievement, assessment, accountability, alignment, and access equity. Includes a drawing for prizes!

K-12: Teachers, Teacher Educators, Coordinators

NECA LIGHTS: Extending Our Experience and Building a Web of Teachers

Nan Flickinger, Janet Lane, Mary Winn, Linda Wahlig, and Julie Trell, Sandy Springs Middle School (GA); Elliot Soloway (MI); Gretchen Hahn (MI); Lauretta Burton (GA)

T086 **Room: Ballroom I**

Georgia's NECA LIGHTS 2000 teachers join past participants to tell stories of learning from one another as they embedded technology into their best practices.

K-12: Teachers, Coordinators

Connecting the Crossroads: Connecting to the Future

Linda Roberts, U.S. Office of Educational Technology

T087 **Room: Ballroom IV**

As our schools enter the new millennium, technology will increasingly play a role in teaching and learning. Roberts will highlight the Clinton administration's strategies and accomplishments and provide a preview of next steps and future commitments contemplated for the next five-year national plan for technology.

K-12: Coordinators

PAPERS

Two papers per one-hour session.

Interactive Computer Models for Science Education

Hisham Al-Haddad (WV), Mike Little (WV)

T088 **Room: 166W**

The authors will illustrate the major role interactive learning and critical thinking play in high-school education, especially in the field of science. Teaching traditional science concepts in innovative ways helps increase students' knowledge and promote their interest in the basic sciences. See the models described in the paper and how high-school teachers are using them in a number of science classes.

9-12: Teachers

Wheatland: An Exercise in Systemic Change

Debra Dirksen (CO), Major Donald Tharp

T089 **Room: 166W**

Hear the evaluation results of a rural school district's professional development Goals 2000-funded efforts to provide all teachers and administrators in the district with training and laptop computers.

K-12, University/College: Coordinators, Postsecondary Educators

Web-Based Extended Learning through Discussion Forums

Mary Jo Parker (TX)

T090 **Room: 156W**

AP biology labs create the focal discussion threads for an online forum between two campuses within one district. User tracking throughout the forum will be analyzed.

9-12: Teachers, Coordinators

Images of Teaching with Computer Technology: A Metaphorical Perspective

Karthigeyan Subramaniam (New Zealand)

T091 **Room: 156W**

Illuminating teachers' images of teaching with computer technology using metaphors: A perspective on teachers' language of practice with computer technology.

General, K-12, Community College, University/College: Teachers, Teacher Educators, Postsecondary Educators, Coordinators

BEYOND THE CROSSROADS, WHERE DO WE GO FROM HERE?

Taking Responsibility for Our Global Society

Andrea Sage (New Zealand), Megan McDonald (New Zealand)

T092 **Room: 255W**

Discover how New Zealand's heritage of appreciating and successfully managing its natural resources, combined with a multimedia approach to education, inspired a profound learning experience for students that encouraged empathy, tolerance, and respect.

General; Teachers

Communicating a Strategic Vision of Education Technology to Key Decision Makers

Connie Stout (TX)

T093 **Room: 254W**

Discussions with key decision makers getting you down? Get EDvancenet tools that provide research-based information on technology and student achievement, educational equity, and workforce preparedness. (Sponsored by COSN)

K-12; Coordinators

Enriching the Learning Experience: The Value of a FirstClass Solution

Scott Welch (ON)

T094 **Room: 362W**

Experience the power of a FirstClass educational community. This session will highlight FirstClass as the most effective solution for building a collaborative community of learners. (Exhibitor presentation)

General, K-12, Community College, University/College: Teachers, Teacher Educators, Postsecondary Educators, Coordinators

DISTANCE LEARNING

Designing Courses with CLASS® : Web-Based Courses for Distance Learning

Kathy Northrop (NE), Cindy Roiné (NE)

T095 **Room: 368W**

CLASS™ award-winning Web-based courses are designed to maximize student learning using leading-edge technology. Learn what's involved in creating courses for a complete Web-based high school diploma sequence.

General; Teachers, Postsecondary Educators

CONNECTING TECHNOLOGY TO TEACHING AND LEARNING

Instructional Strategies and Technology Integration

Bring the World to Your Classroom through National Geographic School Publishing Educational Web Site Products

Dorothy Perreca (DC), Kathy Bailey

T096 **Room: 369W**

The new National Geographic Education Web Site provides teachers and students with materials for creating innovative projects and reports.

K-12; Teachers, Coordinators

Project K12-Search: Lessons and Search Interface for Electronic Information Literacy

David Raker (MA), Jamie Callan (PA)

T097 **Room: 257W**

What use is the Internet, if students can't use it effectively? K12-Search is a collaborative project that attempts to address the challenges and rectify the problems faced in many elementary school classrooms.

K-12; Teachers, Coordinators

CONCURRENT SESSIONS

Wired for Success: A Cross-Curricular Collaboration

Jennifer Walts (GA), Regina Baker (GA), Sharon Joiner (GA), Cathy Lane (GA)

T098 W

This fast-paced session will gi ewed enthusiasm for tackling techno to-use ideas, reasons to collaborate, recipe for success!

K-6; Teachers, Teacher Educators, Coordinators

Project-Based Learning

Linking Learning to Life: Model, Tools, and Strategies Linking Electronic and Real Communities

Pat Donohue (ND), Vera Uyehara (ND), Jerry Feltis (ND), Mary Beth Kelley-Lowe (ND), Steve Lindaas (ND), Alison Wallace (ND)

T099 **Room: 364W**

Extending technology experiences to real-world adventures gives learners an opportunity to construct personal understandings of new material, then use problem-solving skills to transfer understanding to new environments.

General, K-12, Community College, University/College; Teachers, Teacher Educators, Coordinators

Fostering Critical Thinking

Expand Student Research and Technology Skills with Spreadsheets

Jan Rader (CA)

T100 **Room: 360W**

Experience the fun of performing simple data collection activities and using electronic spreadsheets to easily record and brilliantly display the findings (in any content area).

General, K-12; Teachers, Teacher Educators, Coordinators

Language Arts and Social Studies

They Came to Ellis Island: Using the Computer to Study Immigration

Denise Crisci (NY)

T101 **Room: 261W**

Learn how to use the power of technology to relive the immigrant experience.

4-8; Teachers, Teacher Educators, Coordinators

Computer Science

Teaching Computer Science with Java: The Good, the Bad, and the Ugly

Tom West (Canada)

T102 **Room: 366W**

Examine important issues such as student expectations, development environments, hardware requirements, teaching issues (objects first), and questions such as "What about the AP?"

9-12; University/College; Teachers, Teacher Educators, Postsecondary Educators

Special Needs and Assistive Technology

Project DEVISE: Creating Virtual Reality Environments for Students with Learning Disabilities

Debra Sprague (VA), Chris Dede (VA), John Castellani (VA), Mike Behrmann (VA), Jim Chen (VA)

T103 **Room: 165W**

Students with learning disabilities often have difficulty understanding abstract science concepts. We have developed and implemented three-dimensional virtual environments that enhance their learning and motivation.

General, 9-12; Teachers, Teacher Educators

Internet/Web

Alternative Classrooms: Effective Learning Anywhere, Anytime

Suzanne Miller (CA)

T104 **Room: 363W**

Explore how to use technology to create anytime, anyplace alternative classrooms for students while maintaining the integrity of the curriculum. (Exhibitor presentation)

K-12; Teachers, Coordinators

Adding Asynchronicity to Your Learning Environment with Technology

Curt Minich (PA)

T105 **Room: 160W**

Allow your students to interact with classmates, teachers, and learning materials at any time of the day from any location with free, easy-to-use Internet technologies.

Community College, University/College, 6-12; Teachers, Teacher Educators, Postsecondary Educators

Funding, Planning, and Implementation

You Want It to Do What? When? Coordination in a Districtwide Network

Janet Meisel (CA)

T106 **Room: 256W**

Learn the most effective steps in building the districtwide network you need.

General, K-12; Coordinators

Staff Development

Virtual Academy: An Online Staff Development and Community Project

Juli Garton (WI), Louis Loeffler (WI), Kristine Diener (WI), Susan Hodges (WI)

T107 **Room: 267W**

Learning occurs 24 hours a day at the Virtual Academy, (www.stritch.edu/~techacad/virtual), where staff development is presented anytime, anyplace, and at any learning pace. Learn how to create effective online courses for your students.

General, K-12, Community College, University/College; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Lighthouse Links ... Teachers Helping Teachers Integrate Technology

Laura Mates (IN), Renee Driskell (IN), Cathy McFarland (IN)

T108 **Room: 268W**

Join us as we share ideas for implementing a teacher-to-teacher mentoring model focusing on the curriculum integration of technology. (Sponsored by ACM/SIGCUE)

K-12; Teachers, Coordinators

Successful Professional Development Doesn't Just Happen

Kelly Starr (WA), Greg Butler (WA)

T109 **Room: 264W**

Teacher professional development requires much more than machine and software training. Learn how individual teacher skill assessment, goal setting, and resource linking can become foundations for your professional development program.

K-12; Teachers, Coordinators

Preservice and Graduate Teacher Education

Models for Change: Streamed Video Connects University and K-12 Model Classrooms

M. D. Roblyer (GA), O. P. Cooper (GA), William Wiencke (GA)

T110 **Room: 269W**

Learn how streamed video links model classrooms in schools to those in a teacher education program to promote collaborations between preservice teachers, K-12 students, and faculty.

General, K-12; University/College; Teachers, Teacher Educators, Coordinators

STANDARDS, ASSESSMENT, AND ACCOUNTABILITY: STAYING CONNECTED

Find Your Way through the Multimedia Maze

Roberta Marshall (TX), Beverly Burks (TX)

T111 **Room: 157W**

Presenters will help you navigate through the maze of multimedia software features by demonstrating and comparing six popular programs from AppleWorks® slideshow to PowerPoint®.

General; Teachers, Teacher Educators, Coordinators

CONNECTED COMMUNITIES: SCHOOLS, BUSINESSES, AND RESOURCES

Sharing Cyberspace through RITS Nights- A Community Educational-Technology Model

Joan Parris (AL), Cindy McCoy, Matt Akin

T112 **Room:** 161W

Learn how Deshler High School in Alabama took a $10,000 grant and stretched it to benefit students, teachers, administrators, staff, and community members through the Research, Inservice, and Technology in a Safe Environment (RITS) Nights Project.

General, K–12: Teachers, Coordinators

Emerging Technologies: College Guidance and Admissions Meet the Internet

Young Shin (CA)

T113 **Room:** 158W

Internet solutions provide students, educators, and administrators with new options for effectively managing college guidance and admissions.

Community College, University/College, 9–12: Coordinators

Social, Ethical, and Policy Issues

Policy- and Regulation-Driven Technology Reform and Implementation

Hank Stabler (AZ), Ladd Bausch (AZ), Shawn Wheeler (AZ), Debra Raeder

T114 **Room:** 260W

Learn about the government, district, and school policies: regulations, procedures, and guidelines that facilitate smooth educational-technology reform and implementation.

General, K–12, Community College, University/College: Teacher Educators, Postsecondary Educators, Coordinators

SPOTLIGHTS

Evaluating Technology Effectiveness: The Quest for the Elusive "Best Way"

Michael Hannafin, University of Georgia

T115 **Room:** Ballroom II/III

Explore research and evaluation findings on the effects of technology in K–12 settings. Identify problems and issues related to evaluating and identifying the characteristics of effective programs.

K–12: Teachers, Teacher Educators, Coordinators

Key Factors in Effective Staff Development

Jeanie Weathersby, Georgia State University

T116 **Room:** Ballroom IV

Find out about strategies for staff development linked to student achievement. Hear important practices schools should consider when making staff development decisions.

General, K–12: Teachers, Coordinators

PAPER

Active Learning Strategies in Computer Graphics

Ronald Curtis (NJ), John Najarian (NJ)

T117 **Room:** 366W

Active learning models are applied to computer graphics. A progression of student activities builds on student contributions to the learning experience.

Community College, University/College: Postsecondary Educators

BEYOND THE CROSSROADS, WHERE DO WE GO FROM HERE?

Cincinnati Public Schools Wired for the Future

David Hickey (OH), Gini Browsh (OH)

T118 **Room:** 254W

Learn how Cincinnati Public Schools is providing Internet connectivity to more than 2,600 classrooms and 85 sites using the latest in network technologies: asynchronous transfer mode (ATM).

General, K–12, Community College, University/College: Teachers, Teacher Educators, Coordinators

Information Technology Enterprises: A Student Technology Support Business

Taylor Hill (OK), Regina Barsh (OK), Dana Mason (OK), Sara Schoenefeld (OK)

T119 **Room:** 255W

Learn how students earn credit by operating a PC repair shop that services the technology infrastructure of more than 90 district sites.

9–12: Teachers, Coordinators

Grow What You Know with Web-and-Flow

Thomas March (NSW)

T120 **Room:** 257W

How can you integrate the Web and still have a life? Use Web-and-Flow, Tom March's latest creation designed as a comprehensive tool, online community, and professional development courseware.

General, K–12: Teachers, Teacher Educators, Coordinators

Windows® 2000 in Education

David Tapang (WA), Don Keeler (MO)

T121 **Room:** 362W

Don't miss this opportunity to see a demonstration of the exciting new capabilities of Windows 2000 presented by Microsoft® personnel. (Exhibitor presentation)

General, K–12, Community College, University/College: Teachers, Coordinators

DISTANCE LEARNING

Online and On Target: Critical Issues for Effective Internet Courses

Raymond Rose (MA), Zahrl Schoeny (VA), Alice Smith (MA)

T122 **Room:** 368W

This panel will identify the critical issues such as structure, preparation, and intimacy that online course developers and consumers need to consider as they explore the universe of online courses.

General: Teachers, Teacher Educators, Postsecondary Educators

CONNECTING TECHNOLOGY TO TEACHING AND LEARNING

Technology-Assisted Project-Based Learning

Anthony Jongejan (WA), Kathy Buchanan (WA)

T123 **Room:** 364W

Learn effective use of technology in project-based learning for the elementary- and middle-school classroom through discussion and demonstration.

4–8: Teachers, Teacher Educators, Coordinators

Empowering Students

Coach Your Students to Take the Lead! R*TEC Presents Key Strategies

Christina Blauer (KS)

T124 **Room:** 360W

Find out about a variety of models, tools, and organizations facilitating student leadership and support in the integration of new technologies in K–12 classrooms.

General: Teachers, Teacher Educators, Coordinators

Assessing Student Learning and Connecting to Standards and Assessment

The Electronic Learning Marketplace: A Growing Resource to Support Standards-Based Curriculum and Assessment

Rebecca Meinking (ME), Julie Ellis

T125 **Room: 156W**

Explore the Electronic Learning Marketplace, funded by a U.S. Department of Education Technology Innovation Challenge Grant in Maine. Learn about the project's evolution, tour the Web site, and offer feedback on a published assessment. Then find out how the project is helping teachers align their work with state standards.

K-12; Teachers, Teacher Educators

Laptops

Ubiquitous Computing and Achievement: The Laptop Program's Third Year

Saul Rockman (CA), Melissa Chessler (CA)

T125a **Room: 363W**

In 1996, the Microsoft Corporation initiated a laptop program to explore how student learning was affected by access to personal laptop computers. Three years on, what changes have been observed?

General, K-12; Teachers, Teacher Educators, Coordinators

Preschool and Elementary

Technology Projects in the Elementary Classroom

Christine Beck (OR), Monica Wallace (OR)

T126 **Room: 165W**

Get lessons and ideas for integrating technology into the elementary classroom. See examples of actual uses of technology products and Web sites for teaching.

General, K-8; Teachers, Teacher Educators, Coordinators

Empower Students with Curriculum and Technology

Bob Smith (CA), Linda Reynolds (CA)

T127 **Room: 363W**

Join fourth and fifth graders on a successful journey integrating curriculum and technology as they develop their own informational CD-ROM: "The Mojave Desert—A Child's View."

K-12; Teachers, Coordinators

Language Arts and Social Studies

Bridges Across the Atlantic: Using Technology to Share Cultures

Margaret Thombs (RI), Deanne Forgue

T128 **Room: 261W**

Learn how fourth-grade students in Rhode Island connected with a Swedish class to share culture and knowledge using e-mail and the Internet.

General, K-12; Teachers, Teacher Educators, Coordinators

Technology Creates Enthusiasm for Reading!

Paula Yohe (SC)

T129 **Room: Ballroom I**

See how a variety of technologies can be used in conjunction to motivate students to read. Independent research reveals how test scores in one school have risen as a result of its award-winning library media center.

K-12; Teachers, Coordinators

Math and Science

The Amchitka Study: Otters, Aleuts, and Urchins

Thomas Layton (WA)

T130 **Room: 166W**

High-school and college students can use computers and calculators to analyze an Alaskan village site and gain insight into an ancient culture and the marine ecology of the past.

Community College, 9-12; Teachers, Coordinators

Special Needs and Assistive Technology

Virtually There: VR Design Options for Students with Special Needs

William Wiencke (GA), M. D. Roblyer (GA)

T131 **Room: 369W**

Review past virtual reality (VR) applications for students with physical and cognitive disabilities, discuss VR design options for these students, and demonstrate VR working models.

General; Teachers, Coordinators

Internet/Web

Technology-Enhanced Short-Distance Learning

Chris Clark (IN), Margaret Anderson

T132 **Room: 158W**

See how a variety of on-campus classes use the Web to deliver tests, conduct discussions, and present content. Share your experiences.

General; Teachers, Teacher Educators, Coordinators, Postsecondary Educators

Teaching with the Internet: Creating "Internetized" Lessons

Sheila Gersh (NY)

T133 **Room: 160W**

Learn how to take your traditional lessons and "Internetize" them. Become familiar with hundreds of Internet resources available for your instruction. These will help you create your lessons, projects, cyberguides, and WebQuests.

K-12, University/College; Teachers, Teacher Educators, Coordinators

Multimedia

Powerful Pupil PowerPoint® Presentations Produce Learning

Harry Tuttle (NY)

T134 **Room: 157W**

Learn how to make your students' PowerPoint presentations powerhouses of learning. See how to streamline the process while enlarging the depth of learning.

General; Teachers, Coordinators

Funding, Planning, and Implementation

Educational Technology Plans: Keys for Successful Implementation and Accountability

David Breithaupt (ID)

T135 **Room: 256W**

Uncover the keys to instilling an effective K-12 technology plan that connects technology use to the needs of the curriculum, curricular objectives, and the capabilities of the teacher and school.

K-12; Teachers, Coordinators

STAYING CONNECTED WITH PROFESSIONAL DEVELOPMENT

Staff Development

International Professional Development from a Local Perspective

Kitty Salinas (CA), Helen Coltrinari (Canada)

T136 **Room: 267W**

Internet technology enables video instruction to transcend political and cultural barriers. Find out how in this demonstration. Presenters will address cultural issues intrinsic in sharing wisdom across borders.

K-12; Teachers, Teacher Educators, Coordinators

Georgia to Louisiana: Connecting Technology, Teaching, and Learning Through InTech

Sheila Talamo (LA), Joana Dieterich (LA), Adrianne Hunt (LA), Linda Whitacre (GA)

T137 **Room: 264W**

From Georgia to Louisiana, teachers are integrating technology into their classroom. Discover Louisiana InTech and its successful replication of the Georgia InTech Professional Development Model.

General, K-12, University/College; Teachers, Teacher Educators, Coordinators

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AND ORGANIZATIONAL PARTNERS
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TUESDAY, 4:30–5:30 PM, CONT.

Preservice and Graduate Teacher Education

ISTE's PT³ Grant Initiatives: NETS for Teachers and the National Center for PT³

Heidi Rogers (ID), Peggy Kelly (CA), Don Knezek (TX), Lajeane Thomas (LA)

T138 **Room: 269W**

Details of project activities, services, and products will be discussed by the leadership team and key partners of ISTE's PT³ grant initiatives: NETS for Teachers and the National Center for Preparing Tomorrow's Teachers to Use Technology (NCPT³). Participants will learn specifically how they may benefit from and contribute to this and other important work of the International Society for Technology in Education. (Sponsored by ISTE)

K-12, University/College; Teacher Educators, Postsecondary Educators, Coordinators

Let's Communicate! Using Technology to Support Preservice teachers

Trena Wilkerson (TX)

T139 **Room: 268W**

How can technologies such as e-mail, videoconferencing, and multimedia be used to enhance communication with preservice teachers? One instructor shares her experiences and ideas.

University/College; Teacher Educators

CONNECTED COMMUNITIES: SCHOOLS, BUSINESSES, AND RESOURCES

MarcoPolo Internet Content for the Classroom: Building Quality Partnerships within the Education Community

Todd Brekhus (VA), Lennie Walker, Dan Thoms

T140 **Room: 161W**

Explore the value of establishing lasting partnerships within the educational community for developing quality content, delivering professional development, and meeting the needs of K-12 teachers.

General; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Social, Ethical, and Policy Issues

Computer Camp: Effects on Girls' Computer Attitudes and Skills

Sandra Madison (WI), Min Deng (WI)

T142 **Room: 260W**

Many middle-school girls view computing as a "nerdy" male activity and avoid taking advanced computer courses. Learn how a one-week computer camp changed their attitudes toward computers and increased their skill level.

General; Teachers, Postsecondary Educators

TUESDAY, 5:45–6:45 PM

U.S. DOE Session on Assistive Technology

Access to Information through Assistive Technology

Joe Tozzi (Washington D.C.), Don Barrett (Washington D.C.), Alex Koudry (Washington D.C.)

Ballroom IV

The Assistive Technology Team from the U.S. Department of Education presents this session and demonstration addressing the use of computer-based assistive technology to bring information and information systems to the disabled. The requirements of Section 508 of the Rehabilitation Act of 1973, as amended, will be addressed. A Q & A period will follow the demonstration.

K-12, University/College; Teacher Educators, Postsecondary Educators, Coordinators

TUESDAY, 5:45–6:45 PM

"THRASHERS"-OF-A-FEATHER SESSIONS

More topics and sessions may be available. See the NECC Info Booth and/or the daily newsletter for additional topics added since press time.

Bilingual, ESL, and Foreign Languages
Room: 366W
Jorge Almina, Ana Bishop, Patricia Sarango

Rural Schools and Technology
Room: 363W
LeAnne Brown

Online Instructors- Professors Teaching on the World Wide Web
Room: 166W
Marsha Burmeister

WWEDU: The Web and Education Listservs
Room: 361W
Andy Carvin

Critical Review: Two Models of an Online Course
Room: 161W
Brenda Dressler

Certification Programs in High Schools
Room: 165W
Scott Horan

MidLink Magazine: How to Publish Meaningful Content with Students
Room: 368W
Caroline McCullen

Project Child
Room: 369W
Barbara Rouse

Ozline.com
Room: 156W
Thomas March

Creating K-12 Educational Technology Coordinators
Room: 158W
Diane Smith

Beyond Nintendo: Technology Applications in the Elementary Classroom
Room: 363W
Charlene Woodham-Peace

CHECK THE DAILY NEWSLETTER FOR ADDITIONAL THRASHERS TOPICS!

WEDNESDAY, 8:30–9:45 AM

KEYNOTE

Eye for Opportunity

Duane Ackerman, Chairman/CEO, BellSouth Corporation (GA)

W001 **Room: Hall G**

Ackerman will focus on the enormous opportunities that the information economy and broadband technologies have created for students as learners and future employees, for educators as shapers of technology and technology use, and for communities as the standard-bearers for quality of life. His perspective arises from the breadth of BellSouth operations, which provide telecommunications, wireless communications, cable and digital television, advertising and publishing, and Internet and data services to more than 36 million customers in 20 countries worldwide.

WEDNESDAY, 10 AM–12 NOON

STUDENT SHOWCASE

Located on Level 2, opposite room 265W.

Integrating Technology into the Classroom Using a Project-Based Approach

Carl Davis, University of Alabama-Huntsville, with student Edna Gentry

Students and teachers demonstrate how a project-based classroom has transformed learning into an exciting experience, guided by the teacher and driven by the students' interests.

K–12, University/College; Teachers, Teacher Educators, Coordinators

Fifth Grade Will Never Be the Same (The Best and Longest Year of My Life)

Charlotte Dreher, Shallowford Falls Elementary School-Cobb County Schools (GA), with students Laura Scott, Ryan Forman, Philip Krogel, Erin Fleming, Julia Harris

Fifth Grade students will demonstrate projects completed with PowerPoint®, Microsoft® Word, the Internet, TimeLiner™, and Flash™ 4 software.

The Adventure Agent Technology Club

Janet Johnson, Atlanta Public Schools (GA)

Learn how our students make an "adventure" out of technology integration as they conduct fact-finding missions and make presentations using technology available in their schools.

K–12; Teachers, Coordinators

POSTERS

All Web posters take place in Room 367W

Building School and University Partnerships for Educational Reform

Ron Aust (KS), Loriene Roy (TX), Brian Newberry (KS)

PS-W97-10, Table 9

How can schools and universities best partner to apply technology to curriculum reform? Four Directions partners describe successful collaborations across 4 universities and 19 schools.

K–12, Community College, University/College; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

The Education Connection Grant, Southern Style

DeAnna Blaylock (MS), Eva Guice (MS), Pam Berberette (MS)

PS-W98-10, Table 4

See how Mississippi educators radically changed their teaching styles through a partnership with their local public television station and participation in a technology challenge grant.

General, K–6; Teachers, Teacher Educators, Coordinators

MetroLINC: An Urban-Suburban Collaboration for Technology Professional Development

Lisa Breit (MA), Alice Santiago (MA)

PS-W99-10, Table 8

Learn how MetroLINC is bringing 4,500 teachers up the technology learning curve to support statewide curriculum reform in Massachusetts through a unique urban-suburban collaboration.

K–12; Teachers, Teacher Educators, Coordinators

Wish You Were Here: Virtual Vacations

Beverly Burks (TX), Roberta Marshall (TX), Carol Shields (TX)

PS-W100-10, Table 6

Students used digital cameras, scanned images, graphics, and text to record vacation memories. Learn how this motivating project can be implemented in your classroom.

K–12; Teachers, Teacher Educators, Coordinators

Just for Kids

Leticia Ekhami (GA), Shu-Hsien Chen (GA)

PS-W101-10, Table 7

Receive new classroom curriculum ideas derivable from the fascinating, valuable, and user-friendly resources found on Web pages designed for students by U.S. government agencies.

K–12; Teachers, Teacher Educators, Coordinators

Integrating Online Projects into Your Curriculum

Rita Harris Watts (NC), Patricia Medlin (NC), Donna Ashmus (NC)

PS-W102-10, Table 12

Need ideas for integrating inexpensive online projects in your curriculum? See and learn about actual projects created by teachers.

K–12; Teachers, Coordinators, Teacher Educators

STC Digital: Virtual Support for School Technology Coordinators

Susan Lancaster (KY), Jana Hickey (KY), Judy Reeves (KY), Karen Ender (KY) Cheryl Hepp Basham (KY), Roger Basham (KY), Keith Barnes, Pat Meurer (KY)

PS-W103-10, Table 3

Check out a Web-based resource designed to support the school technology coordinator as technology leader, administrator, and provider of technical support. Also promotes professional development.

K–12; Teachers, Coordinators

Help Your Students Gain Real-Life Experience with an Internet Stock Market Simulation

Jeanne Moellendick (NY)

PS-W104-10, Table 5

Students learn research, synthesis, analysis and decision-making skills when they invest $100,000 of virtual money in free stock market competitions featured on www.MainXed.com. Teacher's guide correlates to standards.

General; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Linux from 20,000 Feet: Executive-Level Evaluation of Linux and Other UNIX Derivatives

Richard Williams (IN), Brenda Williams (IL)

PS-W105-10, Table 10

Explore executive-level evaluations of Linux and other UNIX derivatives in enough detail to ensure informed consideration of alternative operating systems in an academic environment.

Community College, University/College, 6–12; Postsecondary Educators, Coordinators

Enriched Lesson Plans with Computer Multimedia

Yixin Zhang (LA)

PS-W106-10, Table 1

See tangible productions of lesson plans, applicable to all levels, using computer multimedia platforms.

General, K–12, Community College, University/College; Teachers, Postsecondary Educators

CONCURRENT SESSIONS

WED., 10 AM-12 NOON, CONT.

WEB POSTERS

All posters take place in Room 367W.

Professional Development to the Classroom: Foundations, Integration Institute, Administrator Academy

Kay Abernathy (TX), Jennifer Bergland, Linda VanWagner, Susan Pennington, Joyce Logan, David Wallace, Ted Hasselbring

IPS-W107-10, Table 20

The Brazos-Sabine Connection, a consortium of 15 noncontiguous school districts in Texas with funding from the Technology Literacy Challenge Fund by way of the Texas Education Agency, is addressing the challenge of educator professional development.

Learning Pathways: Internet-Style Curriculum Collaboration

Janet Arnett (TX), Karen Vander Molen (TX)

IPS-W108-10, Table 19

Learning Pathways is a Web resource for teachers, students, curriculum specialists, and instructional technologists. It merges Internet technology with a district curriculum to create communication, collaboration, and interaction-enhancing activities.

K-12: Teachers, Coordinators

Touring the Oasis

Terrie Gray (CA), Susan Hess (NY), Kate Roberts (MS)

IPS-W109-10, Table 24

Need help finding what you're looking for online? Explore ED's Oasis, designed by teachers for teachers!

K-12: Teachers, Coordinators

Beyond Four Walls: Building an Elementary Classroom Web Site

Micki Vieille (PA)

IPS-W110-10, Table 18

Find out how a well-constructed classroom home page functions on multiple levels to support curriculum, facilitate communication, and enhance teamwork within a wider educational community.

General, K-12: Teachers, Coordinators

Online Learning with Amazon River Dolphins

Susan Reid (CA), Shelly Luke (CA), Tracy Anne Sena (CA)

IPS-W111-10, Table 15

Learn how three educators traveled to Peru and created the Amazon River Dolphin Web site. Find out how you can use this site in your classroom.

4-8: Teachers, Coordinators

Selena on the Move: Bridging Internet Learning

Catherine Ritter (TX), Regina Woods (TX)

IPS-W112-10, Table 14

How do you integrate the Internet into your early childhood classroom? Presenters will discuss how. Learn about e-mail projects and how to implement a nationwide project.

K-3: Teachers

The Solution Site

David Sentner (WV)

IPS-W113-10, Table 22

This presentation will address the content and method of development for a teacher-created Web site (www.thesolutionsite.com) containing K-12 thematic units integrating technology into three curriculum areas.

K-12: Teachers, Teacher Educators, Coordinators

High-Tech Service Learning: Joining School and Community

Pam Van Walleghen (IL), Lara Hebert (IL), Evangeline Pianfetti (IL)

IPS-W114-10, Table 23

Educators model technology-rich projects that move the nexus of learning from the classroom to the community and help students act as agents of positive change.

K-12, University/College: Teachers, Teacher Educators, Coordinators

Technology Competencies in Teacher Education: An e-Showcase of Best Practices

Pam Wanga (MN), Barbara Ann Herrmann (MN), Jeanne Hites (MN), Bryan Miyagishima (MN), Tim Harms, Lee Gray, Jim Reineke

IPS-W116-10, Table 16

Join the Minnesota State Colleges and Universities team for an interactive Web showcase of best practices in Technology Competencies in Teacher Education (TCTE).

General: Teachers, Teacher Educators, Postsecondary Educators, Coordinators

WebQuests: Powerful, Safe Classroom Use of the Internet

Maureen Yoder (MA), Angeline Ferris (MA)

IPS-W117-10, Table 17

Find out how WebQuests motivate both teachers and students and promote responsible use of the Internet.

K-12: Teachers, Teacher Educators, Coordinators

WEDNESDAY, 10:30-11:30

SPOTLIGHTS

Life beyond Technology Audits: Turning Advice into Action

Christopher Moersch, National Business Education Alliance (OR)

W002 **Room: Ballroom IV**

Technology use profiling in schools has become a major fad. But what effect is it having on classroom pedagogy? Learn specific strategies to transform advice into systemic action.

General, K-12: Teacher Educators, Postsecondary Educators, Coordinators

Finding the $300 Billion and Writing Quality Proposals

Allen Schmieder, JDL Technologies, Inc. (MN)

W003 **Room: 157W**

Revealed: Secrets and wisdom gained from the review of more than 10,000 proposals. You'll learn to identify resources, develop a long-range funding strategy, and write the effective proposals you need to get the funding you want.

General, K-12: Teachers, Coordinators

Lights, Camera, Learning! What's New from Apple for Education

Tony Lee, Apple (CA)

W003a **Room: 160W**

Whether it's connecting schools to their community with desktop movies or extending the reach of their network with Airport wireless networking, Apple is helping schools get the most from their investment in technology. This session will focus on the latest Apple tools, products, and solutions for education and provide compelling examples of their application in schools.

K-12, General: Coordinators

BEYOND THE CROSSROADS, WHERE DO WE GO FROM HERE?

Capturing Digital Television's Power to Educate

Carl Ladd (VA), Sharon McNeil (GA)

W004 **Room: 165W**

The television in your classroom is changing: It is combining great video and online content to form a new kind of digital programming.

K-12, Teachers, Teacher Educators, Coordinators

DISTANCE LEARNING

Developing an Online Course Program: Things to Consider

Wendy Burns (GA)

W005 **Room: 166W**

You need to answer some basic questions before developing online K–12 courses. Explore those questions and answers and explain different models of online offerings.

K–12; Coordinators

Online Science Explorations from the American Museum of Natural History

Caroline Nobel (NY), Francine Millman (NY)

W005a **Room: 161W**

See an overview of innovative new technology projects that connect people of all ages to real science and real scientists.

General, K–12, Community College, University/College; Teachers, Teacher Educators, Coordinators

CONNECTING TECHNOLOGY TO TEACHING AND LEARNING

Technology Integration

Using the Internet to Integrate the Arts with Other Disciplines

Lynne Clement (DC)

W006 **Room: 264W**

In this session, teachers will learn to integrate the arts across the curriculum through the creative application of technology. They will become familiar with the wealth of interdisciplinary, standards-based resources on the Web sites of the Marco Polo partners. Teachers will also acquire skills necessary to find resources appropriate for planning multidisciplinary lessons.

K–12; Teachers, Teacher Educators

Computer Labs and Classroom Technology Working Together

Barbara Migdalen (NJ), Betty Johnson (NJ)

W007 **Room: 261W**

There has been a move toward phasing out computer labs and placing all technology in the classrooms. Learn why we should maintain the K–8 computer lab as a viable curriculum-infused learning environment.

K–8; Teachers, Coordinators

World Languages

Change the Traditional High School World Language Classroom through Technology

Robert Morrey (CA)

W008 **Room: 267W**

Create a dynamic and effective multilevel world language classroom through the use of technology and other resources.

9–12; Teachers, Teacher Educators, Coordinators

Facilitating Learning in Teams, Fostering Critical Thinking, Promoting Interdisciplinary Learning, and Empowering Students

DSL Network News-We're on the Right Track!

Kris Drake (CA)

W009 **Room: 260W**

Learn how students at a California elementary school became video stars while creating a current events show. Explore a strategy for integrating reading, writing, and research through video technology.

General, K–12; Teachers, Coordinators

Preschool and Elementary

Using Reality-Based Learning with Primary Students

Joyce Fitch (IL)

W010 **Room: 255W**

Learn how primary students used technology to solve a problem for a community partner. Technology discussed includes cameras, charts, databases, spreadsheets, slideshows, and Web pages.

K–12; Teachers, Teacher Educators, Coordinators

Language Arts and Social Studies

Postcard Geography: A Crossroad for Technology and Geography

Laurie Heikkila (OH), Leni Donlan (DC), Jan Carr (OH), Terri Garfinkel (OH)

W011 **Room: 254W**

Integrate your geography curriculum with reading, writing, mathematics, and technology, including exchanging and designing postcards and collecting statistics about the United States and the world.

K–6; Teachers, Teacher Educators

Critical Thinking and Technology: Revolutionizing Vocabulary Acquisition

Ogden Morse (ME)

W012 **Room: 269W**

Discover an entirely new approach to vocabulary acquisition and reading comprehension employing critical thinking and multimedia software to enhance student learning and teacher instruction.

Community College, 4–12; Teachers, Coordinators

Math and Science

Technology Makes Individualized Basic Mathematics Possible

Rebecca Giles (AL), Matt Akin

W013 **Room: 168W**

Learn about technology-based, individualized instruction in basic mathematics. Computerized diagnostic tests and computerized learning systems individualize and instruct students who need a nonlecture learning format.

Community College, 6–12; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

NASA Math, Science, and Engineering Education Using Robotics

Jeffrey Seaton (VA), John Evans

W015 **Room: 256W**

Find out how NASA Langley's Learning Technologies Project is enabling K–12 students to apply math, science, and computer technology skills to real-word problems through a variety of robotics-based programs.

General; Teachers, Teacher Educators, Coordinators

Special Needs and Assistive Technology

Using Technology to Engage Students with Disabilities: A Teacher's Guide

Christy Johnston (NC)

W016 **Room: 169W**

Technology can be accessible to every child in your classroom. Simple tips and tricks using personal computers, Macintosh™ OS, and Internet browsers help you become savvy in adaptive technology.

K–12; Teachers, Teacher Educators, Coordinators

Internet/Web

Web Site Design Using a Systems Approach

Michael Ruffini (PA)

W017 **Room: 364W**

Designing a Web site? Get all the basic design principles you need to get started. Learn how to use a systems approach and ensure a comprehensive and quality site.

General, K–12, Community College, University/College; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Multimedia

Video Jammin: Video Projects across the Curriculum

Floyd Braid (GA)

W018 **Room: 257W**

Discover how, with very little video equipment, teachers can help students create exciting and meaningful videos for classroom projects. See student poetry and journals make the leap to video.

General, K–12; Teachers, Coordinators

WED., 10:30-11:30 AM, CONT.

Multimedia, Continued

Creating Interactive Lessons with PowerPoint'

Terence Cavanaugh (FL), Cathy Cavanaugh (FL)

W019 **Room: 360W**

PowerPoint is highly effective for classroom presentations. Learn all the tricks, including navigation buttons, hyperlinks, Web links, multimedia elements, and Visual Basic for Applications.

General; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Support and Maintenance

Help! Where Did My File Go?

Ann Harris (MD)

W020 **Room: 268W**

Do your students or teachers have problems with computer files? Join us to discuss file management and see a demonstration of Teknimedia's exciting new multimedia training solution.

General, K-12, Community College, University/College; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Research

SIGTE Presents: Annual Research Award on Technology in Teacher Education

Dale Niederhauser (UT), Marianne Handler (IL), with winners Kara Dawson, Aileen Nonis

W021 **Room: 158W**

Hear the winners of this year's ISTE SIGTE Research Award on Technology in Teacher Education present leading-edge research on the role of technology in teacher education. Their paper is titled "Preservice Teachers' Experiences in a K-12/University Technology-Based Field Initiative: Benefits, Facilitators, Constraints, and Implications for Teacher Educaton."
(Sponsored by ISTE's SIGTE)

General, University/College; Teachers, Teacher Educators, Postsecondary Educators

STAYING CONNECTED WITH PROFESSIONAL DEVELOPMENT

Organizational Structures That Support Teaching and Learning with Technology: Developing University and Statewide Leadership for Change

Steven Gilbert (DC), Nancy Cooley, Michelle Johnston, Susanne Chandler

W022 **Room: 366W**

Learn how to organize effectively to provide leadership for university-level and statewide initiatives focused on teaching and learning with technology.

General, University/College; Teacher Educators, Postsecondary Educators, Coordinators

Staff Development

Put the Right Tools in the Right Hands to Do the Right Things

Larry McHaney (TX), Bryce Johnston (TX), Carolyn Carroll (TX)

W023 **Room: 361W**

Technology is only a tool, but the right tool enables a skillful artisan to create a masterpiece. Lubbock ISD's system empowers teachers with the right tools for effective teaching.

K-12, University/College; Postsecondary Educators, Coordinators

Preservice and Graduate Teacher Education

Teacher Education and Technology at the Crossroads

Carolyn Cox (GA), Adele Ducharme (GA), Mimi McGahee (GA)

W024 **Room: 156W**

Teacher education reform through the infusion of technology produces a learner-centered, technology-empowered classroom that improves student achievement. See how a collaborative effort is used to build this new model.

Community College, University/College, 6-8; Teacher Educators, Coordinators

Assessment of Distance Learning

Eric Knutsen (NY), Sandra Flank (NY)

W025 **Room: 362W**

A rationale and proposed scheme for evaluating the learning that results from technology infusion in teacher preparation distance learning classes will be presented.

Community College, University/College; Teacher Educators, Postsecondary Educators

STANDARDS, ASSESSMENT, AND ACCOUNTABILITY: STAYING CONNECTED

Training, Curriculum Standards, and Technology: Cooking Up a Great Recipe

Glenda Gunter (FL), Janie Phelps (FL)

W026 **Room: 363W**

Find out how to form a partnership blending curriculum standards, instructional strategies, and technology to improve teacher training and student achievement.

K-12, Community College, University/College; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

MOVING BEYOND THE CROSSROADS: TEACHERS AS AGENTS OF CHANGE

Students' Curriculum-Based Telecomputing as Teachers' Authentic Professional Development

Judi Harris (TX), Lynda Abbott (TX), Courtney Glazer (TX)

W027 **Room: 369W**

What do teachers learn as they help their students learn? How can we document and amplify this "authentic professional development" by collaborating with other educators?

K-12; Teachers, Postsecondary Educators, Coordinators

CONNECTED COMMUNITIES: SCHOOLS, BUSINESSES, AND RESOURCES

It Takes a Village: Preparing Technology-Proficient Teachers through Partnerships

Mary Simeone (OR), Lois Cohen (OR), Dan Dunham (OR)

W028 **Room: 368W**

Join this discussion of a U.S. government-funded project uniting K-12 schools, high-tech corporations, and higher education to create a technology-rich teacher preparation program in Portland, Oregon.

K-12, Community College, University/College; Teacher Educators, Coordinators

WEDNESDAY, 11:45 AM-1:15 PM

LUNCHEON & KEYNOTE

Connecting for Success

Betty Siegel, President, Kennesaw State University (GA)

W028a **Room: Ballrooms I-III**

Siegel will bring her remarkable sense of humor and perspectives on how we cope with change and the future to the NECC 2000 luncheon program. She has been instrumental in the inclusion of technology in the teacher preparation program in Georgia and is widely recognized for her vison and leadership. As Kennesaw State University President, Siegel is focused on the potential of technology to improve and affect education, specifically its effect on the university. She recently hired a Chief Information Officer to ensure that KSU is moving forward to meet the needs of its students and faculty.

$25 ticket purchase is required.

WEDNESDAY, 12 NOON–1 PM

SPOTLIGHTS

Prairies, Pioneers, and Partnerships: Matching Standards, Resources, and Engaging Projects

Annette Lamb, University of Southern Indiana (TX)

W029 **Room: Ballroom IV**

Survive on the cyberprairie by aligning standards, selecting useful resources, and developing engaging, technology-rich projects. Find partners and build your own Little School on the Cyber-Prairie.

General, K-12; Teachers, Teacher Educators, Coordinators

The EarthPulse Center: Students Interacting with Their Changing World

Henry Olds, Logal.net/Riverdeep Interactive Learning (MA)

W030 **Room: 160W**

Gain a new appreciation of how the Web can offer students learning experiences that directly support and extend curricular objectives, especially in math and science. See how students can use the Earth Pulse Center to explore and understand hurricanes.

General, K-12, Community College, University/College; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

WebTech: A Professional Development Program

Traci Redish, Kennesaw State University (GA); Jerrie Cheek (GA); Michael Murray (GA)

W031 **Room: 157W**

Learn how WebTech is untangling the mysteries of the Web by providing practical hands-on training for teachers in the areas of research, communication, resources, online activities, Internet projects, and Web publishing.

General, K-12, University/College; Teachers, Teacher Educators, Coordinators

BEYOND THE CROSSROADS, WHERE DO WE GO FROM HERE?

Giving Internet Instruction a Human Face: SMILe or HREF Tracks

Matthew Nickerson (UT), Kathleen Webb (UT)

W032 **Room: 362W**

Streaming video technology is transforming education. See how lectures are delivered digitally by a dynamite teacher in an online humanities course. It will blow you away—really!

Community College, University/College, 9–12; Teachers, Curriculum Specialists, Postsecondary Educators

The Changing Face of Education

Dan O'Shea (FL)

W033 **Room: 366W**

Find out how Generation Y will use technology in the near future inside and outside the classroom and how universities can meet the next generation's needs.

General, K-12, Community College, University/College; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

DISTANCE LEARNING

Videoconferences in Learning

Karl Seller (MI), James Watkins (OH), Robert Fox (MI)

W034 **Room: 269W**

Explore the challenges of implementing a fully integrated videoconferencing solution and discover how videoconferencing is transforming today's learning environment.

General; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

CONNECTING TECHNOLOGY TO TEACHING AND LEARNING

World Languages

Technology and the Modern Language Classroom

Maryanne Boettjer (PA)

W035 **Room: 264W**

Technology in the foreign-language classroom enhances students' knowledge of the world through opportunities to practice language skills. Sample projects, rubrics, templates, and student work are presented.

General, K-12; Teachers, Teacher Educators, Coordinators

Project-Based Learning

Connections along the Crossroads

JoAnn Gadicke (WI), Shannon McCoy (OK)

W036 **Room: 267W**

Learn how two teachers came together to work on the ISTE/NETS writing team for technology standards and built student partnerships in interactive learning.

General, K-12; Teachers, Teacher Educators, Coordinators

Fostering Critical Thinking

Learning Worlds Interacting with Technology

Emily Stewart (IL)

W037 **Room: 260W**

Technology is revolutionizing learning worlds. Learn how technology impacts the thinking tools of disciplines (e.g., the scientific process) and supports integrated and independent self-directed learning.

K-8; Teachers, Teacher Educators, Coordinators

Assessing Student Learning and Connecting to Standards and Assessment

How to Design Technology-Rich Lesson Plans in 15 Minutes or Less

Steve Thompson (CA), Judith Stein (FL), Steve Thompson (CA)

W038 **Room: 268W**

Save significant time creating lesson plans that correlate to state standards and assessment tests by using iMind's state-of-the art intranet and Internet technology.

K-12; Teachers, Coordinators

Preschool and Elementary

K-2- What's Out There for You?

Gail Lovely (CA)

W039 **Room: 166W**

Buckle up and get ready for a wild ride as you explore the best technological tools available for the youngest of learners. Computers belong beside tempera paints—see it for yourself.

K-3; Teachers, Teacher Educators, Coordinators

Language Arts and Social Studies

Civil War Perspective: A Technology-Connected Lesson

David Edgy (GA), Carol Grainger (GA), Kay Harrell (GA), Angela Morris (GA), Tami Murphy (GA), Jane Tomberlin (GA), Laurel Warren (GA)

W040 **Room: 165W**

Through the example of a technology-connected lesson on the Civil War, learn how to make technology work effectively in the classroom.

General, 4-12; Teachers, Coordinators

Overcome Fear of Writing: The "Write" Strategies and Tools

Joanne Nelson (CA)

W041 **Room: 255W**

Help students of all ages overcome their fear of writing through the use of the computer. Read student-written papers developed under the program.

General, Community College, University/College, 4-12; Teachers, Postsecondary Educators, Coordinators

Math and Science

Discover the Environment Online

Shelbey Cooper (VA), Jana Jones

W042 **Room: 161W**

Learn about a variety of Internet-based activities and resources for students and educators interested in bringing nature and conservation topics to the classroom.

General, K-12; Teachers, Teacher Educators, Coordinators

Math and Science, Continued

Graphic Visualization in Multivariable Calculus Using MATLAB'

Joshua Du (GA), Marlene Sims (GA), Kirk Shanks (GA)

W043 **Room: 156W**

Learn about a package of high-quality graphic illustrations designed to increase students' understanding of underlying mathematical concepts in calculus. Take the graphs back to your classroom for demonstration.

Community College, University/College, 9–12: Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Internet/Web

SIG/Tel's Online Learning Awards: Project Presentations

Susan Silverman (NY), Betsy Frederick (NM)

W044 **Room: 168W**

Teachers in Grades K–16 will showcase successful projects and discuss how they organize their classroom curricula to maximize student opportunities to learn using telecommunication networks. (ISTE's SIG/Tel Society Session)

K–12: Teachers, Coordinators, Teacher Educators

Multimedia

Teacher Teams Create Desktop and Web-Based Courseware

Gertrude (Trudy) Abramson (FL), George Fornshell (FL)

W045 **Room: 364W**

Examine team-created Web courseware, discuss the collaborative process, and learn how authentic experiences prepare teachers to mentor collaborative multimedia-based explorations with their students. (Sponsored by ISTE)

General, K–12: Teachers, Teacher Educators, Coordinators

Teaching through Technology

Devlynne Reynolds (AL)

W046 **Room: 261W**

See student-produced multimedia projects and portfolios where students have taken control of their learning as they research, outline, and design multimedia projects around curriculum topics. Hear about how Alabama's Monroe County raised $25,000 to buy the equipment and how you can integrate free and low-cost software into your existing curriculum.

General, K–12: Teachers, Coordinators

Support and Maintenance

Tech Coordinator Secrets: Hot Links for All

Martha Savage (LA), Dusty Rowland (LA), Aimee Anthony (LA)

W047 **Room: 257W**

Ever wonder how your technology coordinator knows all the best Web sites? Join us, and we'll share our secrets.

K–8: Teachers, Coordinators

Evaluation

Improving Evaluations of Technology Integration and Distributed Learning

Sheila Cassidy (CA), Nancy Gadzuk Drexler, Cheryl Garnette

W048 **Room: 254W**

Learn strategies for improving evaluations of technology integration and distributed learning activities. Get recommendations for improving capacity, focus, conduct, and support for quality evaluations.

K–12, General, University/College: Coordinators

STAYING CONNECTED WITH PROFESSIONAL DEVELOPMENT

Captured Wisdom: Adult Literacy Educators' Stories of Integrating Technology

Lynda Ginsburg (FL)

W049 **Room: 169W**

Watch adult literacy teachers and learners share innovative, replicable technology-rich activities and discuss how to fully use "virtual classroom visits."

General, Community College: Teachers, Teacher Educators, Postsecondary Educators

Staff Development

Tear Down the Walls: Taking Teacher Training to New Heights

Toni Norris (SC), Robert Cole (SC), Lynn Nolan (SC)

W050 **Room: 158W**

With assistance from two federal grants, Greenville County Schools have initiated an innovative teacher training model to integrate technology with curriculum standards.

General, K–12, University/College: Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Celebrating the Century: An Interdisciplinary Unit for Professional Development

Kendra Pamenter (IL), Siri Hartsfield (IL), Karen Thompson (IL), Sue Ruff (IL), Cindy Huson (IL)

W051 **Room: 361W**

Learn how development of a multimedia, student-centered, interdisciplinary project about the 20th century engages adult learners participating in summer professional development.

K–12: Teachers, Coordinators

Pacific Algebra Network: Distance Learning for Teacher Professional Development

Kavita Rao (HI), Barbara Dougherty (HI)

W052 **Room: 360W**

Reaching teachers in a geographic area of 4.9 million square miles of ocean, the Pacific Algebra Network uses distance learning for teacher professional development in an innovative algebra teaching methodology.

General, K–12, Community College: Teachers, Teacher Educators, Coordinators

STANDARDS, ASSESSMENT, AND ACCOUNTABILITY: STAYING CONNECTED

Developing Assessment Strategies for Technology Integration: Three Diverse Case Studies

Abbie Brown (WA), Koh Herlong (NC), Thomas Caswell (NY), Timothy Naxel (Canada)

W053 **Room: 363W**

Hear from three inservice educators about their success stories in assessing technology integration. Topics include the use of laptop computers in a private K–12 school, schoolwide integration of computers in a K–8 rural school, and an Internet-based discussion forum in a high-school social studies class.

General, K–12, University/College: Teachers, Teacher Educators, Coordinators

MOVING BEYOND THE CROSSROADS: TEACHERS AS AGENTS OF CHANGE

Innovation from the Source: A Professional Development Model

Christina Devitt (NY), Tim Flannery

W054 **Room: 369W**

Learn about a professional development model that puts teachers and curriculum in charge of technological innovation by encouraging faculty to work collaboratively to create meaningful, technology-rich projects.

General, K–12, Community College, University/College: Teachers, Teacher Educators, Postsecondary Educators

CONNECTED COMMUNITIES: SCHOOLS, BUSINESSES, AND RESOURCES

Teacher-Initiated, Museum-Based Curriculum Development: A Case Study

Craig Cunningham (IL), Julie Blue (IL), Michelle Warden (IL)

W055 Room: 368W

Imagine developing engaging Web-based curriculum with access to the resources of world-class museums. You can. Hear presenter experiences and future plans for this collaborative project.

General: Teachers, Coordinators

Social, Ethical, and Policy Issues

Are You Guilty Of. ? Copyright Issues on the Internet

Kimberly McCoy (OH)

W056 Room: 256W

Explore, in-depth, current copyright law, works covered, works not covered, fair use, and how copyright is applied to the Internet.

General, K-12, Community College, University/College: Teachers, Teacher Educators, Coordinators

WEDNESDAY, 1:30-2:30 PM

SPOTLIGHTS

NASA Science-Here's to the Dreamers

David Powe, NASA (MS)

W056a Room: 160W

Here's to the dreamers, who help us see
Beyond our blindness to what can be
Imagination to see beyond the wall
Here's to the dreamers, we need them all.

Dreamers is a dynamic past/present/future sensory experience. Enticing the senses through sight, sound and song, the Dreamers "live" presentation challenges and encourages participants to dream.

K-12: Teachers, Teacher Educators, Coordinators

BEYOND THE CROSSROADS, WHERE DO WE GO FROM HERE?

There's Something about Movies: QuickTime® 4.0 Exposed

Gerald Crisci, (NY), Ken Holvig (NY)

W057 Room: 166W

Take two! Grab your director's chair and join us on a fascinating look at the latest classroom video editing technologies.

General, K-12: Teachers, Teacher Educators, Coordinators

Multipurpose Network Design and Implementation

Rick Hillman (NJ)

W058 Room: 369W

Learn how to design and implement a data network that will serve multiple purposes in K-12 and community college classrooms. We will also present information on the delivery of voice and video.

K-12, Community College: Coordinators

DISTANCE LEARNING

Implementing Distance Education Programs in K-12 Schools: Opportunities and Challenges

Joseph Scherrer (PA), Lynne Schrum (GA)

W059 Room: 362W

Learn about Germantown Academy's progress toward successful phased-in implementation of distance education programs (ITV and online) supporting both curricular enrichment and faculty professional development.

K-12: Teachers, Coordinators

CONNECTING TECHNOLOGY TO TEACHING AND LEARNING

Project-Based Learning

Ellis Island/Chicago: Breaking Ranks with the Teacher-Centered Classroom

Suzanne Hemminger (IL), Donna Castelli (IL), George Smith (IL), Wilma Williams (IL), Gail Tennial (IL), Kevin Waller (IL)

W060 Room: 264W

Break ranks with tradition by using technology to empower students as learners. Students can't embrace technology if their teachers won't, so find out how technology is changing the way veteran teachers teach.

6-12: Teachers, Teacher Educators, Coordinators

Gender Equity

Alternative Technology: How to Keep Adolescent Girls Interested in Technology

Marilyn Piper (WA), Craig Costello (WA)

W061 Room: 267W

Find out how this 1999 Intel Innovations in Teaching Award–winning course is addressing the issue of gender imbalance in technology. Participating girls are learning technology skills using topics like women's self-defense, eating disorders, and career exploration.

General, K-12, Community College, University/College: Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Empowering Students

Seven Cybertrends in the Classroom That Will Define Your Future

Viki Lawrence (BOP), Andrew King (New Zealand)

W062 Room: 260W

E-business puts the world's information at one's fingertips. See how children can become savvy in the ways of e-business.

General: Teachers

Assessing Student Learning and Connecting to Standards and Assessment

NETS for Students: Connecting Curriculum and Technology

Peggy Kelly (CA), James Wiebe (CA), Joyce Friske (OK)

W063 Room: 261W

Hear the authoring teachers and the managing editor of the National Educational Technology Standards (NETS) Project describe how the document was developed, how it's being used, and why it is such an important resource. (Sponsored by ISTE)

K-12, University/College: Teachers, Teacher Educators, Coordinators

Laptops

Distributed Learning Environments: Mobile Laptop Labs

Jill Hobson (GA), Kim Head (GA)

W064 Room: 303W

Create a mobile computer lab that puts technology into the hands of students without tying up instructional space. Hear how Forsyth County School System has re-engineered the traditional computer lab.

General: Teachers, Coordinators

Preschool and Elementary

International Multimedia Connections Enhance Young Children's Learning

Jacqueline K. Bowman (CT), June L. Wright (CT), James Strauss (CT), Pirjo Kantolo (Finland), Jarrko Lahtinen (Finland)

W065 Room: 255W

See how integrating multimedia technology improves learning by looking at shared electronic books produced by children in Connecticut and Finland.

K-3: Teachers, Teacher Educators, Coordinators

WED., 1:30-2:30 PM, CONT.

Language Arts and Social Studies

Potent Partners: Poetry and Technology

Sally Humble (NC)

W066 **Room: 269W**

SAS inSchool's Visualizing Poetry product series offers a radical new approach to reading and writing instruction, using technology to bring poetry to life and stimulate every student.
(Exhibitor presentation)

Community College, 6-12: Teachers, Teacher Educators, Postsecondary Educators, Coordinators

The Trails Project: A Technology Innovation Challenge Grant

Joyce Jennings (OR)

W067 **Room: 157W**

History projects about the Oregon and Sante Fe trails provide a prime example of classroom technology incorporation. See examples of projects and learn what has worked and what has not.

K-6: Teachers, Teacher Educators, Coordinators

Math and Science

Enhancing the Teaching of Mathematics with Scientific Notebook

Jonathan Lewin (GA)

W068 **Room: 158W**

See how Scientific Notebook can revolutionize the teaching of mathematics. You'll even learn how to use the program as a "whiteboard" and then load your notes to your own Web site! This session is a great introduction for those without experience creating Web sites.

Community College, University/College, 9-12: Teachers, Postsecondary Educators

Farragut Connected for Learning: Flexible Approaches with Science Technology Tools

Nancy Witick (TN), Jane Skinner (TN)

W069 **Room: 161W**

From AP to zoology, our science teachers and students find that a flexible arrangement of mobile computer carts provides versatility and variety when using technology tools.

6-12: Teachers

Computer Science

Practical Computing- A Survey Computing Course

Scott Smith (GA)

W070 **Room: 168W**

Learn about a team-taught, project-based course encompassing word processing, spreadsheets, graphics, database development and use, multimedia, programming, and Web site design.

Community College, 6-12: Teachers, Teacher Educators, Coordinators

Special Needs and Assistive Technology

From Concrete to Abstract: Developing Inquiring Learners

Carol Shields (TX)

W071 **Room: 368W**

View projects used with students in an at risk program. Find out how the program gave students a better understanding of technology as a tool and the ability to demonstrate practical applications of mathematics in real life.

K-12: Teachers

Internet/Web

101 Ways to Use the Internet in Your Classroom

Corinne Burton (CA)

W072 **Room: Ballroom IV**

Learn ways to maximize the effectiveness of the Internet in your elementary- or middle-school classroom! Address general Internet integration, use of the Internet as a tool for demonstration and interaction, and Internet navigation.

K-8: Teachers, Teacher Educators, Coordinators

The "Ize" Have It: Creating Curriculum-Based Web Pages

Keith Kyker (FL), Christopher Curchy (FL)

W073 **Room: 364W**

See your students' best efforts on the Web. Learn how to create a successful curriculum-based Web site with your students. Topics include software, planning, organization, and common pitfalls.

General, K-12, Community College, University/College: Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Multimedia

Managing and Assessing the Development of Multimedia Projects

Karen Ivers (CA), Ann Barron (FL), Elena Tinder (CA)

W074 **Room: 165W**

Learn to manage the development and assessment of multimedia projects. See rubrics, organization charts, and more.

K-12, Community College, University/College: Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Rev It Up! Racing Across the Curriculum

Mark Rice (MS), Perry Reeves

W075 **Room: 360W**

Learn about Racing Across the Curriculum, an effort that uses technology and racing as a teaching and learning tool. The project uses HyperStudio®, NASCAR 3, the Internet, laserdisc and DVD technology, and Photoshop® along with major racing teams.

K-12, University/College: Teachers, Teacher Educators, Postsecondary Educators

Support and Maintenance

Top 10 Printer Troubleshooting Tips

Len Scrogan (CO)

W076 **Room: 257W**

Ever feel like throwing your printer out the window? Find out the top 10 causes of printer frustration and how to solve them. Next time your school's printer malfunctions, you can be the one who knows how to fix it.

K-12: Teachers, Coordinators

Evaluation

Of Methods and Madness: Design Considerations for Educational-Technology Evaluation

Kirk Vandersall (CA), David Quinn (IL)

W077 **Room: 254W**

Review research design and methodological considerations for assessing the effect of educational technology on student achievement at the district level or higher.

General, K-12, Community College, University/College: Coordinators

STAYING CONNECTED WITH PROFESSIONAL DEVELOPMENT

Travel + Live Chats + Internet = Better Teaching in History and Social Studies

Ben Swecker (VA), Beverly Thurston (VA)

W078 **Room: 169W**

WorldNet: Virginia allows teachers traveling in foreign countries to post journal entries and pictures to the Web and to participate in live chats. What better way to expose your students to the world's riches?

General, K-12, University/College: Teachers, Postsecondary Educators, Coordinators

Staff Development

Teaching Teachers with Advanced Learning Technologies

James Levin (IL), Ray Rose (MA), Linda Polin (CA), Margaret Honey (NY), Sandy Levin (IL), Greg Waddoups (IL), Judi Fusco, Michael Waugh (CA)

W079 **Room: 361W**

Join this panel of experts as they discuss the process of developing and conducting online education for K-12 teachers. If you're interested in using new technologies for ongoing teacher learning and development, this session is for you.

General, K-12, University/College: Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Professional Development Online: High Quality and Highly Effective

Chet Linton (UT)

W080 **Room: 268W**

Professional development online can be interactive, enjoyable, and rewarding. Discover some of the effective options and resources available on demand to educators through SchoolImprovment.Net.

General, K-12, Community College, University/College; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Preservice and Graduate Teacher Education

Transforming Teacher Education

Elizabeth Holmes (GA), Polly Adams (GA)

W081 **Room: 156W**

The Transforming Teacher Education (TTE) project partners three Georgia universities and 10 PK-12 partner schools to restructure teacher education programs using technology as a catalyst for change.

Community College, University/College; Teachers, Teacher Educators, Postsecondary Educators

CONNECTED COMMUNITIES: SCHOOLS, BUSINESSES, AND RESOURCES

The Myth and Reality of Educational Technology in Botswana

Krishan Lull Kumar (Botswana), Tony Morrison (Botswana), Paul Nleya (Botswana)

W082 **Room: 366W**

Realities of technology development in Southern Africa, specifically Botswana, will be explored, including the development of partnerships to achieve technology application and integration for global competitiveness.

University/College; Teacher Educators, Postsecondary Educators

Social, Ethical, and Policy Issues

Distance/Distributed Education's Role in Bridging the Digital Divide

Nancy Gadzuk Drexler (MA), Sheila Cassidy (CA), Cheryl Garnette (DC)

W083 **Room: 256W**

See an overview, synthesis, and recommendations for strategies, resources, alliances, research, and evaluation for using distance/distributed education to close the gap of the digital divide.

General, K-12, Community College, University/College; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

WEDNESDAY, 3–4 PM

SPOTLIGHTS

Lessons for the Millennium: From the Journals of Lewis and Clark

Warren Buckleitner, Children's Software Revue (NJ)

W084 **Room: 160W**

Using the Lewis and Clark expedition, this multimedia keynote address contrasts the excitement and uncertainty felt by our young country at the very dawn of the 1800s—with the excitement and uncertainty that technology offers for education today.

General; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Using Satellite Delivery as a Bridge for the Digital Divide

Janie Smith, Georgia Public Broadcasting (GA)

W085 **Room: 157W**

Participants will leave this session with a knowledge of how technology from the simple to the sophisticated is being used by PeachStar Educational Services, a Division of Georgia Public Broadcasting, in bridging the Digital Divide.

K-12, Community College, University/College; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

Learning in the Age of Creativity

David Thornburg, Thornburg Center for Professional Development

W085a **Room: Ballroom IV**

This presentation explores the emergence of technology-supported tools for creative exploration and problem solving that will provide learners with the skills they will need to thrive in the coming years. Sponsored by NetSchools Corporation. Includes a drawing for prizes.

General, K-12; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

BEYOND THE CROSSROADS, WHERE DO WE GO FROM HERE?

Tomorrow's Textbooks – Today: A Glimpse into the Future

Randy Gunter (FL), Glenda Gunter (FL)

W086 **Room: 166W**

Take a visionary and interactive tour of tomorrow's textbooks and how they will incorporate the World Wide Web. Today's exciting Web-enhanced textbooks will be highlighted.

General; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

"North Star Dreaming": Presenting Student Dreams for the Future

David Wagner (CA), Peter Reynolds (MA)

W087 **Room: 267W**

FableVisionaries presents works of young filmmakers and expresses their visions of a more positive world. View highlights from the first FableVisionary Film Festival.

K-12; Teachers, Coordinators

CONNECTING TECHNOLOGY TO TEACHING AND LEARNING

Instructional Strategies and Technology Integration

Technology, Learning, and Teaching: Lessons Learned

Margaret Bingham (NC), Elizabeth Byrom (NC)

W088 **Room: 261W**

Hear lessons learned from providing technical assistance and professional development in instructional technology for schools and districts, and consider ways to apply those lessons to your own situation.

General; Teachers, Teacher Educators, Coordinators

Preschool and Elementary

"Pair-It": Pairing Literacy and Technology

Jan Whelan (TX)

W091 **Room: 255W**

Read the "Pair-It" way. By using both printed books and CD-ROMs, explore how K-3 reading comprehension is increased through activities pairing fiction and nonfiction sources.

K-3; Teachers, Teacher Educators, Coordinators

Language Arts and Social Studies

Applying Technology-Connected Units to Achieve State Standards

Lee Grafton (CA), Diane Kline (CA)

W092 **Room: 256W**

Directors of technology and curriculum teamed up to enable teachers to design and deliver technology-connected units that meet the California Language Arts Standards. Training from Georgia's InTech Program combined with peer coaching resulted in technology-connected lessons that work.

General, K-12; Teachers, Teacher Educators, Postsecondary Educators, Coordinators

American Frontiers: Using Laptops To Experience Multicultural History

Leslie Nicodemus (FL), Lili Betancourt (FL)

W093 **Room: 165W**

History comes alive for students as they use laptop technology to understand the past. This student-centered multicultural project is applicable to all grades.

K-12; Teachers

WEDNESDAY, 3–4 PM, CONT.

Math and Science

A Learning Community: Using Technology to Enhance Student Success

Bette Ambrose (MI), Julie Brown (IN), Martin Maguire (IL), Rob Osterman (MI), Mike Harmon (IN), MaryKay Marks (MI), Joellyn Zielazinski (IL)

W094 **Room: 161W**

Teachers from three states discuss projects developed through a U.S. Department of Education Technology Innovation Challenge Grant that use e-mail, the Internet, and teleconferencing to create materials designed to improve student learning.

6–12; Teachers

Integrating Assessment, Evaluation, Curriculum, and Instruction in the GenScope Genetics Learning Environment

Daniel Hickey (GA), Ann Kindfield (NJ), Paul Horwitz (MA), Mary Ann Christie (MA)

W095 **Room: 168W**

A four-year effort supported and documented dramatic learning gains in secondary genetics. We will demonstrate downloadable software and curricula and summarize our assessment system and results.

9–12; Teachers, Teacher Educators

Curriculum-Based Mathematics Software: Examples, Strategies, and Advantages

Michel Pitre (Canada), Vic D'Amico (Canada)

W096 **Room: 158W**

High-school mathematics teachers have myriad software programs available to maximize their effectiveness in the classroom. Learn to make the most of today's technology—and free yourself to provide more individual assistance to students.

K–12; Teachers, Teacher Educators

What Is Simulation, and How Can It Make You Rich?

Charles Shub (CO)

W097 **Room: 156W**

Most educational software uses some form of simulation. Learn the basics of simulation, what it is, and how and why it is used. (Sponsored by the Society for Computer Simulation [SCS], International)

General, Community College, University/College, 9–12; Teachers, Teacher Educators, Postsecondary Educators

Using Computer Manipulatives in Elementary Math Instruction

Tammy Stephens (WI)

W098 **Room: 260W**

Get the latest on current research results in addition to ready-to-use lesson plans and modeling of effective instructional techniques.

K–6; Teachers, Teacher Educators, Coordinators

Computer Science

Cyber Careers for the Net Generation

Allen Parrish (AL), Peter Saflund (WA), Manjari Wijenaike (WA)

W099 **Room: 264W**

See the results of the Cyber Careers project, which is designed to provide information on IT careers to middle- and high-school students. (Sponsored by the IEEE Computer Society)

K–12, Community College, University/College; Teachers, Teacher Educators

Special Needs and Assistive Technology

Internet Textbooks: Helping Students Learn More!

Mark Horney (OR), Lynne Anderson-Inman (OR), Carol Kennedy (NY)

W100 **Room: 369W**

Learn to evaluate digital textbooks. See examples of novels and history and science textbooks infused with resources to help at-risk students read and learn more!

6–12; Teachers, Teacher Educators, Coordinators

Internet/Web

Managing the Web Site

Leslie Fisher (CA)

W102 **Room: 364W**

Learn how to effectively organize your Web site, allow people to update the site without HTML, and make fast-loading Web pages.

General, K–12, Community College, University/College; Teacher Educators, Coordinators

Frankly, I'm Bored with the Future: Educational Leadership in Cyberspace

Gary Stager (CA)

W102a **Room: 169W**

Learn how to assess the role of the Internet in the intellectual and creative lives of children. How should schools respond sensitively to the expectations of high-tech kids?

General; Teachers, Teacher Educators, Coordinators

Multimedia

The Classroom of Tomorrow – Today

Edward Benedict (WI)

W103 **Room: 257W**

Learn how to design an effective multimedia classroom through examples of multimedia tests, student authored CDs, animation, charts and graphs, and teacher presentations on India, Japan, and China.

General; Teachers, Teacher Educators, Coordinators

Positively Pix-illating! Multimedia Creativity with Kid Pix®

Trisha Svaib (CA)

W104 **Room: 269W**

Discover how to create effective multimedia slideshows and reports quickly and easily with Kid Pix Studio 3rd Edition and Kid Pix Activity Kits.

K–6; Teachers, Teacher Educators, Coordinators

Funding, Planning, and Implementation

Writing a Solid Infrastucture Bid Specification

Fred D'Andrea (RI)

W105 **Room: 254W**

Writing bid specs can be a drag. All too often, the product is a shopping list that favors the vendor, not the customer! There are better ways to stretch your dollars so you can maximize your connectivity, but you have to know "the art of the possible."

General; Coordinators

STAYING CONNECTED WITH PROFESSIONAL DEVELOPMENT

Staff Development

Needs- and Site-Based Professional Development: Inquiry and Technology Learning

Catherine Price (GA), Brian Gerber (GA), Andrew Brovey (GA)

W106 **Room: 360W**

Simulate and discuss sample successful teacher staff development projects, including discussion of unique features and key elements for effective future projects.

K–12, University/College; Teachers, Postsecondary Educators, Coordinators

Workshops That Work

Jean Sindhikara (NJ)

W107 **Room: 361W**

Discover a workshop format that entices teachers into future computer use by providing skills that enhance teaching in immediate and purposeful ways.

K–12; Teachers, Coordinators

CONCURRENT SESSIONS

Preservice and Graduate Teacher Education

Teaching Online: Opportunities and Pitfalls

Jan La Forge (OH), Bonnie Mathies

W108 **Room: 362W**

Find out about the interactive nature of online teaching and practical methods for overcoming the problems and challenges in putting a professional graduate degree program online.

University/College; Postsecondary Educators, Coordinators

STANDARDS, ASSESSMENT, AND ACCOUNTABILITY: STAYING CONNECTED

K-12 Educational Technology Update

Jeanne Hayes (CO)

W109 **Room: 368W**

Get to the heart of educators' real use of technology through QED's annual survey results relating directly to technology use in the classroom. Also find out how your state or district fares on purchasing plans, technology budgets and per-pupil expenditures. (Exhibitor presentation)

K-12; Teachers, Coordinators

CONNECTED COMMUNITIES: SCHOOLS, BUSINESSES, AND RESOURCES

The Birth of a Distance Education Consortium

Chuck Chulvick (NJ)

W110 **Room: 268W**

The session provides a description of how the New Jersey Virtual Community College Consortium was founded and how it is now operating in its first full year of operation. (Sponsored by SIGUCCS)

General, Community College, University/College; Postsecondary Educators, Coordinators

Project VBUGS: Teaching Visual Basic Internationally

Anthony Malone (OH), Jean Pryce

W111 **Room: 366W**

This session will describe in detail the necessary steps to successfully market and deliver an existing technology training course abroad in a global initiative.

General, Community College, University/College; Teachers, Postsecondary Educators, Coordinators

Teachers Communicating for Success: nschool.com Shows Schools the Free Way!

Lynne Schrum (GA)

W112 **Room: 361W**

Learn about a free product to create communications among teachers, parents, and students. nschool.com offers educational resources, lesson plan development, shared calendars, and full e-mail.

K-12; Teachers, Coordinators

WEDNESDAY, 4:15–5 PM

CLOSING GIVEAWAYS & NECC 2001 "BUILDING ON THE FUTURE" PREVIEW

GWCC, Hall G

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NECC 2002
San Antonio, TX
San Antonio Convention Center
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Hosted by the National Educational Computing Association (NECA), Inc.

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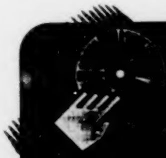

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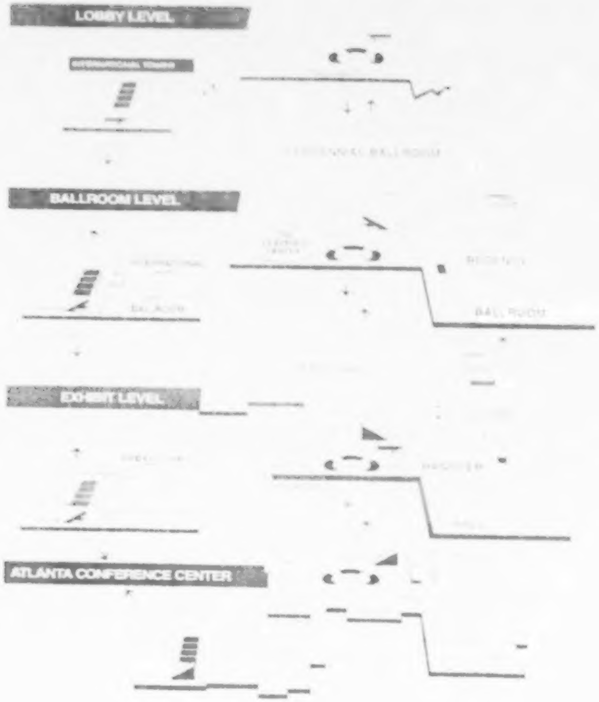
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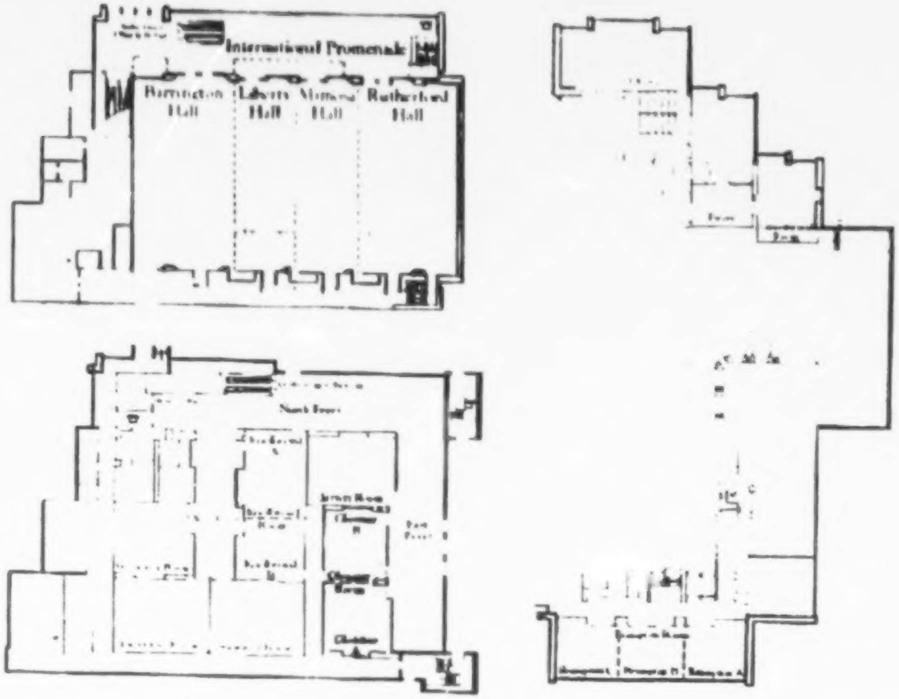
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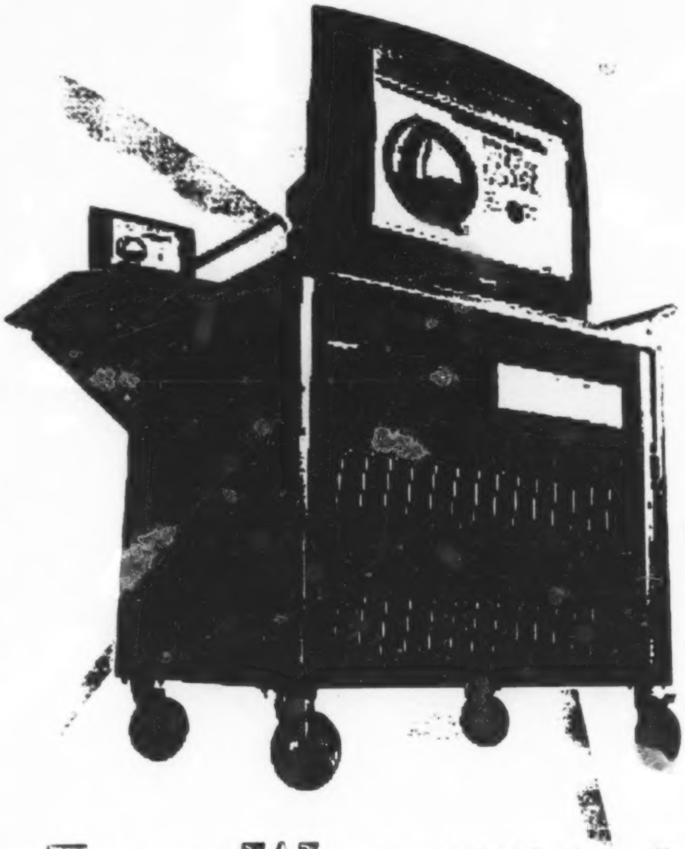

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EXHIBIT HOURS

Monday, 9:45 am–5:30 pm
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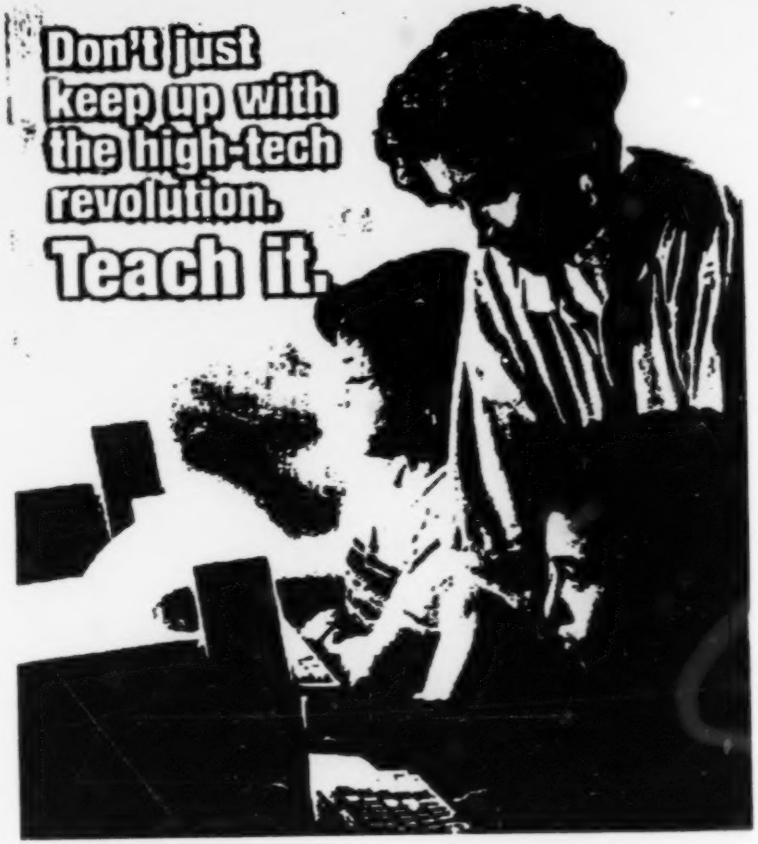
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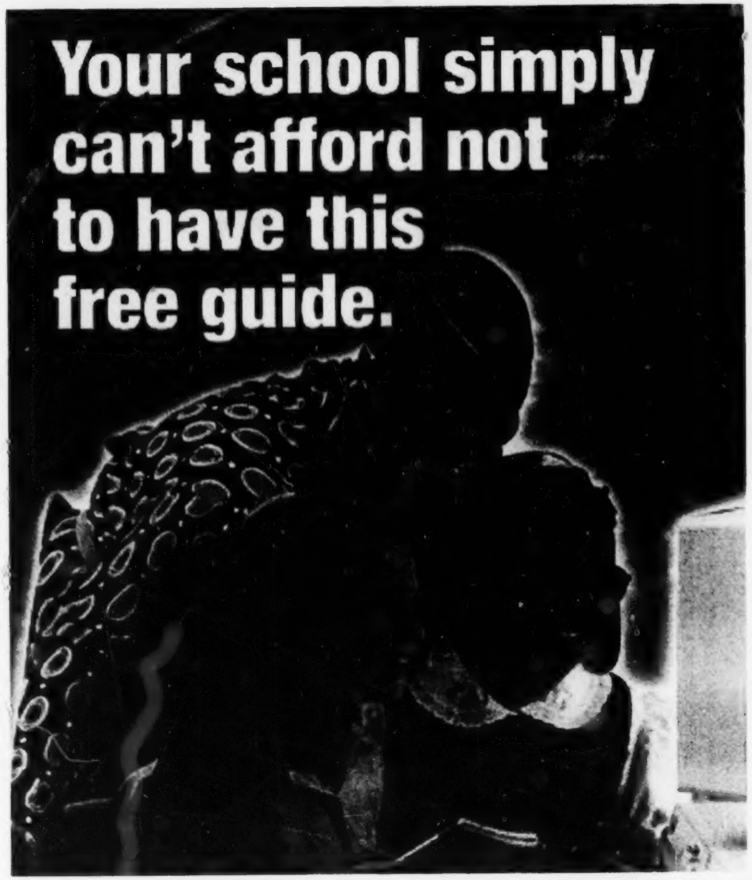
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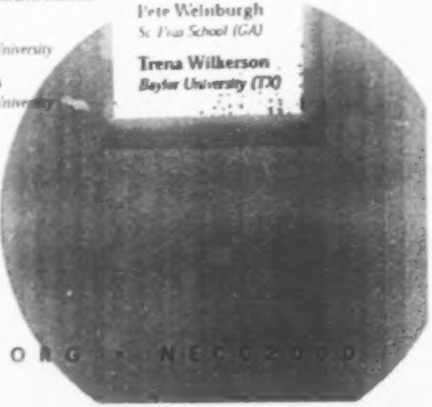

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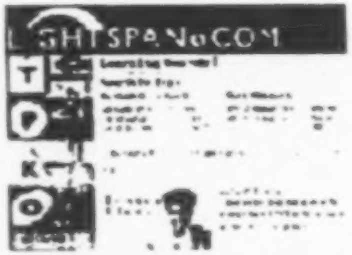

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NECA SOCIETIES

International Society for Technology in Education (ISTE)
www.iste.org

ISTE Special Interest Groups for:

- **Technology Coordinators (SIGTC)**
- **Teacher Educators (SIGTE)**
  www.iste.org

American Association for Higher Education/TLT Group (AAHE/TLT Group)
www.tltgroup.org

Association for Computing Machinery (ACM) Special Interest Groups on:

- **Computers and Society (SIGCAS)**
  www.acm.org/sigcas
- **Computer Science Education (SIGCSE)**
  www.acm.org/sigcse
- **Computer Uses in Education (SIGCUE)**
  www.acm.org/sigcue
- **University and College Computing Services (SIGUCCS)**
  www.acm.org/siguccs

Association for Educational Communications and Technology (AECT)
www.aect.org

Consortium for Computing in Small Colleges (CCSC)
www.ccsc.org

Consortium for School Networking (CoSN)
www.cosn.org

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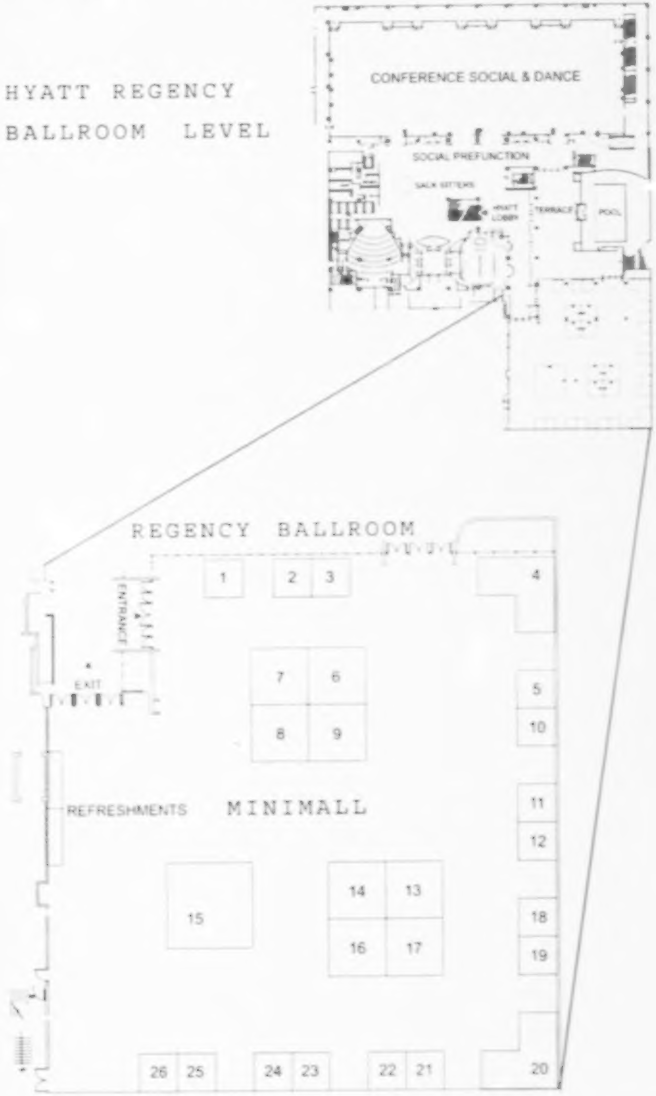
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NECC MINIMALL

Please visit the following Minimall Sponsors, Tuesday evening from 6:30–9 pm in the Hyatt Regency Ballroom.

Exhibitor Name	Booth Number(s)
Classroom Connect, Inc.	13,14
Fonts4Teachers–Down Hill Publishing	11
Forest Technologies	3,6,9
Hewlett-Packard Company	16
IDE Corp.–Innovative Designs for Education	1
ISTE–International Society for Technology in Education	2
Learning Services, Inc.	15
Library Video Company	8
NECC 2000	4
Software Express, Inc.	7
Spectrum Industries	10
VR Toolbox–Classource	23,24
WorldWise Computer Supplies & Accessories	5

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Monday, 9:45 am–5:30 pm
- Continental Breakfast in the Exhibit Hall, 9:45–11 am
- Refreshment Break in the Exhibit Hall, 3–3:30 pm

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Plan your road trip around the Exhibit Hall—who should you visit first?

MINIMALL HOURS

Tuesday,
6:30–9 pm
at the Hyatt

What about the Minimall?

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Exhibitor Name	Booth Number(s)
A-ha! Interactive, Inc.	2544
ABC-CLIO	2744
AbleSoft, Inc.	2825,2827
Academic Distributing, Inc.	2546,2548,2550
Academic Software	468,470
AccuNet™/AP® Photo Archive	1256,1258
Acer America Corporation	2824
Adobe Systems Inc.	648
Advantage Learning Systems, Inc.	2549,2551
Adventus Incorporated	2758
AIMS Multimedia	2862
Aladdin Knowledge Systems	2861,2863
Alcatel Corporation	365,464
Alexandria/COMPanion Corporation	2430,2432
AlphaSmart, Inc.	2620
Altiris	2747
Amer.com	2763
Amera Computers, Inc.	2669
America Online, Inc.	2062
American Education Corporation	2643,2645
American Power Conversion	2742
American School Directory	2355,2357,2359
Animated Communications	2565
ANTEC/Educational Technology Associates & Neufeld Learning Systems	2627,2629
Apex Learning	1568
Apple	1620
Applied Technologies	2262
APTE, Inc.	563,565
Ask Jeeves/The Evergreen Project	944,946
AT&T Learning Network	2422,2424
Aurbach & Associates, Inc.	2420
Barnum Software	2833
Bell Atlantic	1636
BellSouth	1336
bigchalk.com, inc.	1262
Blackboard, Inc.	501,600
Bogen Communications, Inc.	941,943
Bonus.com the SuperSite for Kids	2048
Book Systems, Inc.	2642
Boxer Learning, Inc.	2426,2428
Boxlight Corporation	2469
Brainium.com	354
Britannica Education	2455,2457
Brother International Corporation	330

Exhibitor Name	Booth Number(s)
Bytes of Learning	1454
Cable in the Classroom	2362,2364
CalcuScribe	2360
Canon USA Visual Communication Systems	1648
Canter & Associates, Inc.	1645
Casio, Inc.	1964
CCV Software	620
CDW•G	2468
Centrinity	322,324,326
Centurion Technologies, Inc.	2837,2839
Chancery Software Ltd.	1854
Children's Software Press	242
ChildU, Inc.	2841
Cisco Systems, Inc.	754
Classroom Connect, Inc.	1836
ClassroomDirect.com	420
Cnetics Technologies	2662
Co-NECT Schools	2855
Cognitive Concepts, Inc.	2526,2528
College Broadband	2570
Compaq Computer Corporation	1120
CompassLearning	1554
Compu-Teach Educational Software	246,248
CompUSA Inc.	2136
Computer Curriculum Corporation	1246
Computer Learning Foundation	1050
Computer Literacy Press, Inc.	1650
Computrac	2864
Course Technology/South-Western	1444
CrossTec Corporation	2454
CTB/McGraw-Hill	1154,1156
Cubic Science, Inc.	1560,1562
Curriculum Administrator Magazine	1644,1646
Curriculum Associates, Inc.	430,432
CyberPatrol, Unit of The Learning Company	2100,2101
Daly Computers	770
Data Projections, Inc.	940,942
Data Recognition, Inc.	2556
DataServ, Inc.	2950
DDC Publishing	2261,2263
Dell Computer Corporation	836
Discourse Technologies Inc.	562
Discovery Channel School	2541,2543
Diskovery Educational Systems	[illegible]43
DK Interactive Learning	2536

Exhibitor Name	Booth Number(s)
DreamWriter—NTS Computers	2036
Dukane Corporation	1654
DynaVox Systems Inc.	864
e-Tutor, Inc.	2269
EarthWalk Communications, Inc.	2442
eBoard.com	2370
EBSCO Publishing	868
Edmark Corporation	2120
EDmin.com	236
Education Networks of America	348
Education Week	2537,2636
Educational & Business Systems, Inc.	2561
Educational Insights	226,228,230
Educational Resources	2320,2321,2323,2325, 2327,2329,2331,2333
Educational Software Institute	2237,2239
eHomeRoom.com, Inc.	2702
Eiki International	2630,2632
Electronic Classroom Furniture Systems, L.C.	2354
ELLIS by CALI, Inc.	2571
Encore Software, Inc.	2402
Enova Software Inc.	763
Enterasys Networks	1768
Entrex Software	542
ePALS Classroom Exchange	2601
Epson America	1746
Ericsson Web Com, Inc.	1063
Excelsior Software, Inc.	1754
Fairfield Language Technologies	1944,1946
FamilyEducation Network	1368
Farallon Communications	1549,1551
Fiberworks, Inc.	2657
FOCUS Enhancements, Inc.	2870
Follett Software Company	336
Fonts4Teachers-Down Hill Publishing	2948
Forest Technologies	846
Fortres Grand Corporation	2721,2723
FSCreations, Inc.	2659
Funds for Learning	2944
FUTUREKIDS, Inc.	2169,2171
Gamco/Orchard Software	837,839
Gateway	1544
GCC Technologies	2271
Geist Manufacturing, Inc.	2859
Georgia Educational Technology Conference (GaETC)	701

Exhibitor Name	Booth Number(s)
Get a Clue Software & Services (Lyceum Communications)	2265
Glencoe/McGraw-Hill	1155,1157,1159
GlobaLearn.com	2869
GPN/University of Nebraska-Lincoln	2539
Grafco, Inc.	2637,2736
Greenwood Publishing Group	2868
Grolier Educational	1861,1863
Heartsoft	262,264
Hewlett-Packard Company	2168
Highsmith, Inc.	2829,2831
HighWired.com	2462
Howard Computers	2942
Hyper Technologies	2769
IBM Corporation	2020
IDE Corp.—Innovative Designs for Education	1536
IDG Books Worldwide	2268
imind education systems	2920,2922
INET Library	258,260
Ingenuity Works, Inc./Corel Corporation	2448
Inspiration Software, Inc.	448
Intel Corp.	1954
IntelliTools, Inc.	860,862
Interactive Products Division—Numonics	669,671
Internet Products, Inc.	1561,1563
ISTE—International Society for Technology in Education	1845,1847
iTeach.com	2768
Jackson Software	1461,1463
Jay Klein Productions	733,832
JDL Technologies	746
Jungsoft USA, Inc.	2668
K'NEX Education Division	2648,2650
K-12 MicroMedia Publishing	2836
Key Curriculum Press	2063
Keytec, Inc.	1064
Knowledge Adventure	2320
Knowvation, Inc.	1864
Lawrenceville Press	320
LCSI	1051,1150
Leading Technology Micro, Inc.	2563
Learn.com	2638
Learning Advantage	227
Learning in Motion	2720,2722
Learning Pays.com	2762
Learning Services, Inc.	1220,1320,1820
Learning Tools International	1569

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LearnStar, L.P	1462,1464
Lernout & Hauspie, Kurzweil Education Group	2860
Lexia Learning Systems, Inc.	561
Lexmark International	2102,2200
Library Video Company	845,847
Lightspan, Inc.	426,428,528
LIGHTWARE	2660
Lintor Publishing Center	2501
LittleFingers by Datadesk	2502
Logic Extension Resources	2938
Logical Choice Technologies	364
Long's Electronics Inc.	2569
Lucent Technologies	554
Macromedia, Inc.	2400,2401
Main Xchange, Inc.	265
Market Data Retrieval	1948,1950
Math.com	2500
MathResources Inc.	244
MathXpert	1668,1670
McGraw-Hill Companies	1154,1155,1156,1157, 1158,1159,1160
McGraw-Hill Learning Technologies	1158,1160
Media & Methods Magazine	1744
MediaSmith, Inc.	1545,1547
MediaSpark IT Solutions Inc.	2458
Meridian Creative Group	2820,2822
Micro Warehouse, Inc.	855,857,859
MICRO-INTEL International	345
Micrograms Software	2530,2532
Micron Government Computer Systems, Inc.	1059,1061
Microsoft Corporation	820
Milliken Publishing Co.	841,843
Miramar Systems, Inc.	2542
Misty City Software, Inc.	761
MSCS	2524
MultiMedia Schools/Information Today, Inc.	1949
N2H2, Inc.	2054
NASA Education Program	954,956,958
National Geographic School Publishing	1346,1348,1350
National School Boards Association	1254
National Science Foundation	2527
National Semiconductor Corporation	2728,2730
National Wildlife Federation	2270
NCS	2254
NEC Systems, Inc.	633,732

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NECTAR Foundation	2533
NetSchools Corporation	1054
NetSupport	1468
Network Data Services, Inc.	371
New Forum Publishers, Inc.	2670
NewDeal, Inc.	2626,2628
NewsBank, Inc.	2639,2641
Nippon Educational Computing Association	1251
Nordex International	1162
Nortel Networks	2449,2451
NoteSys	2336,2338,2340
Nova Solutions, Inc.	1951,2050
Nova Southeastern University, Programs in Instructional Technology & Distance Education	445
Nova Southeastern University, SCIS	2241
Novell, Inc.	2520
nschool.com	1268
Optimum Resource, Inc.	768
PAR Technologies, Inc.	2821,2823
Pasco Scientific	1565,1664
Pepperdine University	1960,1962
Perfect Solutions	1947
Peter Li Education Group	851,950
Philips Consumer Electronics	2443,2445,2447
Phoenix Multimedia, Inc.	2946
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PhoneMaster—a Division of US Telecom	2433
Pinnacle Systems, Inc.	2724,2726
Pioneer New Media Technologies, Inc.	936,938
Pitsco LEGO Dacta	2436
PLATO® Education/TRO Learning, Inc.	2743,2745
Polaroid Education Program	1362
Power On Software	660,662
PowerQuest Corporation	2842
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Pre-Owned Electronics, Inc.	1065
Premio Computer, Inc.	1760
Principia Products, Inc.	263
Proxim, Inc.	361,363
Proxima Corporation	2940
Quality Education Data	937,939
Quick Course® Books/OTSI	2061
QuickPAD by H45 Technology, Inc.	2749,2751
Rainbow Educational Media	1247,1249
Rauland-Borg Corporation	2545
Regional Technology in Education Consortium	601

Exhibitor Name	Booth Number(s)
Riverdeep Interactive Learning	536
Sagebrush Corporation	568
SAS inSchool	640
Schepp Turner Productions LLP	2654
Scholastic Inc.	1136
School Center	2600
School Improvement.Net	2201,2300
School Reform News—The Heartland Institute	344
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SchoolOne.com	2936
SCI Technologies	2568
Security Software Systems, Inc.	460
SecurTech Company	343
Sharp Electronics Corp./LCD Products Group	2425,2427
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Sonic Desktop Software	2770
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Sorenson Vision, Inc.	1662
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Teknimedia Corporation	2738
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textHELP Systems Ltd.	2765
The Bureau for At-Risk Youth	1564
The College Board	2844,2846
The FundingFactory	2644,2646
The Gale Group	2236
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The Knowledge Tree Inc.	2623,2625
The Learning Company	1820
The LearningStation.com	2144
The New York Times Learning Network	2554
The Princeton Review Online	760
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thINK4inc.com	1660
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USA TODAY	223,225
Educational Insights	226,228,230
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SMART Technologies Inc.	548
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Lexia Learning Systems, Inc.	561
Discourse Technologies Inc.	562
APTE, Inc.	563,565
Sagebrush Corporation	568
Regional Technology in Education Consortium	601
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SAS inSchool	640
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Toshiba America	654
Power On Software	660,662
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South Central Regional Technology in Education Consortium	700
Georgia Educational Technology Conference (GaETC)	701
U.S. Department of Education	702
Jay Klein Productions	733,832
JDL Technologies	746
Cisco Systems, Inc.	754
The Princeton Review Online	760
Misty City Software, Inc.	761
Enova Software Inc.	763
Yamaha Corporation of America	765
Optimum Resource, Inc.	768
Daly Computers	770
Microsoft Corporation	820
Dell Computer Corporation	836
Gamco/Orchard Software	837,839
Milliken Publishing Co.	841,843
Library Video Company	845,847
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Quality Education Data	937,939
Data Projections, Inc.	940,942

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TopTutors.com	945,947
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Virco Mfg. Corporation	962
Society for Computer Simulation International	965
Computer Learning Foundation	1050
LCSI	1051,1150
NetSchools Corporation	1054
Terrapin Software	1055
Tech4Learning, Inc.	1057
Micron Government Computer Systems, Inc.	1059,1061
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nschool.com	1268
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National Geographic School Publishing	1346,1348,1350
Symantec Corporation	1354
Polaroid Education Program	1362
FamilyEducation Network	1368
SmartStuff Software	1436
Course Technology/South-Western	1444
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Jackson Software	1461,1463
LearnStar, L.P	1462,1464
TeachMaster Technologies	1465
NetSupport	1468
IDE Corp.—Innovative Designs for Education	1536
Gateway	1544

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MediaSmith, Inc.	1545,1547
Farallon Communications	1549,1551
CompassLearning	1554
Cubic Science, Inc.	1560,1562
Internet Products, Inc.	1561,1563
The Bureau for At-Risk Youth	1564
Pasco Scientific	1565,1664
Apex Learning	1568
Learning Tools International	1569
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ThinkQuest	1865
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Market Data Retrieval	1948,1950
MultiMedia Schools/Information Today, Inc.	1949
Nova Solutions, Inc.	1951,2050
Intel Corp.	1954
Pepperdine University	1960,1962
Casio, Inc.	1964

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IBM Corporation	2020
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Bonus.com the SuperSite for Kids	2048
N2H2, Inc.	2054
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Symbol Technologies, Inc.	2160,2162
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Hewlett-Packard Company	2168
FUTUREKIDS, Inc.	2169,2171
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National Wildlife Federation	2270
GCC Technologies	2271
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NoteSys	2336,2338,2340
Sun Microsystems, Inc.	2344
Electronic Classroom Furniture Systems, L.C.	2354
American School Directory	2355,2357,2359
CalcuScribe	2360
Cable in the Classroom	2362,2364
eBoard.com	2370
Macromedia, Inc.	2400,2401
Encore Software, Inc.	2402
Aurbach & Associates, Inc.	2420
AT&T Learning Network	2422,2424
Sharp Electronics Corp./LCD Products Group	2425,2427
Boxer Learning, Inc.	2426,2428

Exhibitor Name	Booth Number(s)
Alexandria/COMPanion Corporation	2430,2432
PhoneMaster—a Division of US Telecom	2433
Pitsco LEGO Dacta	2436
EarthWalk Communications, Inc.	2442
Philips Consumer Electronics	2443,2445,2447
Ingenuity Works, Inc./Corel Corporation	2448
Nortel Networks	2449,2451
CrossTec Corporation	2454
Britannica Education	2455,2457
U.S.News & World Report	2456
MediaSpark IT Solutions Inc.	2458
HighWired.com	2462
CDW•G	2468
Boxlight Corporation	2469
TechLAN	2471
Math.com	2500
Lintor Publishing Center	2501
LittleFingers by Datadesk	2502
Novell, Inc.	2520
MSCS	2524
Cognitive Concepts, Inc.	2526,2528
National Science Foundation	2527
World Book School and Library	2529,2531
Micrograms Software	2530,2532
NECTAR Foundation	2533
DK Interactive Learning	2536
Education Week	2537,2636
GPN/University of Nebraska-Lincoln	2539
Discovery Channel School	2541,2543
Miramar Systems, Inc.	2542
A-ha! Interactive, Inc.	2544
Rauland-Borg Corporation	2545
Academic Distributing, Inc.	2546,2548,2550
Advantage Learning Systems, Inc.	2549,2551
The New York Times Learning Network	2554
Data Recognition, Inc.	2556
PowerSchool	2560
Educational & Business Systems, Inc.	2561
Leading Technology Micro, Inc.	2563
Animated Communications	2565
SCI Technologies	2568
Long's Electronics Inc.	2569
College Broadband	2570
ELLIS by CALI, Inc.	2571
School Center	2600

Exhibitor Name	Booth Number(s)
ePALS Classroom Exchange	2601
Phoenix/BFA/Coronet	2602,2700
AlphaSmart, Inc.	2620
SIRS Mandarin, Inc.	2621
The Knowledge Tree Inc.	2623,2625
NewDeal, Inc.	2626,2628
ANTEC/Educational Technology Associates & Neufeld Learning Systems	2627,2629
Eiki International	2630,2632
Grafco, Inc.	2637,2736
Learn.com	2638
NewsBank, Inc.	2639,2641
Sonnet Technologies, Inc.	2640
Book Systems, Inc.	2642
American Education Corporation	2643,2645
The FundingFactory	2644,2646
K'NEX Education Division	2648,2650
Schepp Turner Productions LLP	2654
Smith System	2655,2754
Fiberworks, Inc.	2657
FSCreations, Inc.	2659
LIGHTWARE	2660
Cnetics Technologies	2662
Walden University	2664
Jungsoft USA, Inc.	2668
Amera Computers, Inc.	2669
New Forum Publishers, Inc.	2670
WIN Laboratories, Ltd.	2671
eHomeRoom.com, Inc.	2702
Learning in Motion	2720,2722
Fortres Grand Corporation	2721,2723
Pinnacle Systems, Inc.	2724,2726
National Semiconductor Corporation	2728,2730
Teknimedia Corporation	2738
Surpass Software	2740
American Power Conversion	2742
PLATO* Education/TRO Learning, Inc.	2743,2745
ABC-CLIO	2744
Altiris	2747
Tangent Computer, Inc.	2748
QuickPAD by H45 Technology, Inc.	2749,2751
Youthline USA	2756
Adventus Incorporated	2758
The Keyboard Instructor by AKT Inc.	2761
Learning Pays.com	2762

Exhibitor Name	Booth Number(s)
Amer.com	2763
textHELP Systems Ltd.	2765
iTeach.com	2768
Hyper Technologies	2769
Sonic Desktop Software	2770
Meridian Creative Group	2820,2822
PAR Technologies, Inc.	2821,2823
Acer America Corporation	2824
AbleSoft, Inc.	2825,2827
Highsmith, Inc.	2829,2831
Barnum Software	2833
K-12 MicroMedia Publishing	2836
Centurion Technologies, Inc.	2837,2839
ChildU, Inc.	2841
PowerQuest Corporation	2842
Vision Database Systems	2843,2845
The College Board	2844,2846
Test University	2847,2849
Welsh Products, Inc.	2851
Co-NECT Schools	2855
teachersroom.com, Inc.	2857
Geist Manufacturing, Inc.	2859
Lernout & Hauspie, Kurzweil Education Group	2860
Aladdin Knowledge Systems	2861,2863
AIMS Multimedia	2862
Computrac	2864
Greenwood Publishing Group	2868
GlobaLearn.com	2869
FOCUS Enhancements, Inc.	2870
imind education systems	2920,2922
TeacherEducation.com–Teacher Education Institute	2924
Vista Associates, Inc.	2926
U.S. Geological Survey	2928
Teacher Universe, Inc.	2930,2932
SchoolOne.com	2936
Logic Extension Resources	2938
Proxima Corporation	2940
Howard Computers	2942
Funds for Learning	2944
Phoenix Multimedia, Inc.	2946
Fonts4Teachers–Down Hill Publishing	2948
DataServ, Inc.	2950

ADVANCE AUGMENTATIVE COMMUNICATION SOLUTIONS

DynaVox Systems Inc.

ASSESSMENT

Aurbach & Associates, Inc.
Logic Extension Resources

ASSESSMENT AND CURRICULUM INTEGRATION

Teacher Universe, Inc.

ASSOCIATION

ISTE—International Society for Technology in Education
National School Boards Association
Nippon Educational Computing Association
Society for Computer Simulation International
WCCE 2001 (World Conference on Computers in Education)

AUDIO/VISUAL PRODUCTS

Long's Electronics Inc.

BUSINESS SOFTWARE

Academic Software
Animated Communications
Ask Jeeves/The Evergreen Project
Diskovery Educational Systems
Educational Software Institute
ELLIS by CALI, Inc.
Fonts4Teachers-Down Hill Publishing
Learning Services, Inc.
MediaSpark IT Solutions Inc.
Microsoft Corporation
Phoenix Multimedia, Inc.
Power On Software
PowerQuest Corporation
Principia Products, Inc.
Quick Course® Books/OTSI
Security Software Systems, Inc.
Software Express, Inc.
Sonic Desktop Software
Sorenson Vision, Inc.
Sun Microsystems, Inc.

CALCULATORS

Texas Instruments Incorporated

CD-ROM PUBLISHER

ABC-CLIO
Adventus Incorporated
AIMS Multimedia
APTE, Inc.
Ask Jeeves/The Evergreen Project
Barnum Software
Boxer Learning, Inc.
Britannica Education
College Broadband
Compu-Teach Educational Software
Cubic Science, Inc.
Curriculum Associates, Inc.
DDC Publishing
Discovery Channel School
DK Interactive Learning
Fairfield Language Technologies
Forest Technologies
Get a Clue Software & Services (Lyceum Communications)
GPN/University of Nebraska-Lincoln
Grolier Educational
Heartsoft
IDE Corp.—Innovative Designs for Education
Ingenuity Works, Inc./Corel Corporation
K-12 MicroMedia Publishing
Learning in Motion
Lexia Learning Systems, Inc.
Lightspan, Inc.
Lintor Publishing Center
MathResources Inc.
MICRO-INTEL International
Micrograms Software
Milliken Publishing Co.
National Geographic School Publishing
Phoenix Multimedia, Inc.
Quick Course® Books/OTSI
Rainbow Educational Media
Riverdeep Interactive Learning
Scholastic Inc.
SIRS Mandarin, Inc.

Steck-Vaughn
SUNBURST Technology
TeachMaster Technologies
Tech4Learning, Inc.
Teknimedia Corporation
The Gale Group
Tom Snyder Productions
Turner Learning, Inc.
Tyndal Stone Media
U.S.News & World Report

COLLABORATIVE TOOLS

Centrinity

COMPUTER ASSISTED INSTRUCTION & TRAINING

CompassLearning
ELLIS by CALI, Inc.

COMPUTER FURNITURE/FURNITURE

Electronic Classroom Furniture Systems, L.C.
Grafco, Inc.
Highsmith, Inc.
Nova Solutions, Inc.
SMARTdesks Ltd.
Smith System
Spectrum Industries, Inc.
Virco Mfg. Corporation

COMPUTER INTERFACE

SCI Technologies

COMPUTER NETWORKS: HARDWARE

Acer America Corporation
Amer.com
Bell Atlantic
BellSouth
Brother International Corporation
CDW•G
Cisco Systems, Inc.
Computrac
Daly Computers
Data Recognition, Inc.
DataServ, Inc.
Diskovery Educational Systems
DreamWriter—NTS Computers
Dukane Corporation
EarthWalk Communications, Inc.
Education Networks of America
Educational & Business Systems, Inc.
Enterasys Networks
Ericsson Web Com, Inc.
Fiberworks, Inc.
Forest Technologies
Gateway
GCC Technologies
Hewlett-Packard Company
IBM Corporation
Intel Corp.
Interactive Products Division—Numonics
JDL Technologies
Jungsoft USA, Inc.
Leading Technology Micro, Inc.
Logical Choice Technologies
Lucent Technologies
Micro Warehouse, Inc.
N2H2, Inc.
NetSchools Corporation
Network Data Services, Inc.
Nortel Networks
NoteSys
PAR Technologies, Inc.
Philips Consumer Electronics
Premio Computer, Inc.
Proxim, Inc.
SCI Technologies
SIRS Mandarin, Inc.
Sonnet Technologies, Inc.
Sun Microsystems, Inc.
Symbol Technologies, Inc.
Tangent Computer, Inc.
TechLAN
Toshiba America
Waters Network Systems
WIN Laboratories, Ltd.
Zenith Electronics Corporation

COMPUTER NETWORKS: SOFTWARE

Academic Distributing, Inc.
Academic Software
Altiris
Barnum Software
CDW•G
CrossTec Corporation
Curriculum Associates, Inc.
Daly Computers
Data Recognition, Inc.
DataServ, Inc.
Diskovery Educational Systems
DK Interactive Learning
DreamWriter—NTS Computers
EarthWalk Communications, Inc.
ELLIS by CALI, Inc.
Enterasys Networks
Ericsson Web Com, Inc.
Excelsior Software, Inc.
Fairfield Language Technologies
Fiberworks, Inc.
Forest Technologies
Fortres Grand Corporation
Gateway
Get a Clue Software & Services
  (Lyceum Communications)
IBM Corporation
IDE Corp.—Innovative Designs
  for Education
imind education systems
Inspiration Software, Inc.
Intel Corp.
JDL Technologies
K'NEX Education Division
K-12 MicroMedia Publishing
LearnStar, L.P
Lexia Learning Systems, Inc.
Lightspan, Inc.
Lintor Publishing Center
Logical Choice Technologies
MathXpert
MediaSmith, Inc.
Micro Warehouse, Inc.
Microsoft Corporation
MSCS
NECTAR Foundation
NetSchools Corporation
NetSupport
Nordex International
NoteSys
Novell, Inc.
Pasco Scientific
Phoenix Multimedia, Inc.
Power On Software
PowerQuest Corporation
Principia Products, Inc.
Quick Course® Books/OTSI
Riverdeep Interactive Learning
Sagebrush Corporation
Schepp Turner Productions LLP
SCI Technologies
Software Express, Inc.
Symantec Corporation
TeachMaster Technologies
textHELP Systems Ltd.
Tom Snyder Productions
Vernier Software & Technology
Winnebago Spectrum/Athena

COMPUTER PERIPHERALS

Academic Distributing, Inc.
Acer America Corporation
Adventus Incorporated
AlphaSmart, Inc.
Amera Computers, Inc.
American Power Conversion
ANTEC/Educational Technology
  Associates & Neufeld
  Learning Systems
Brother International Corporation
CalcuScribe
Canon USA Visual Communication
  Systems
CDW•G
ClassroomDirect.com
CompUSA Inc.
Computrac
Daly Computers
Data Recognition, Inc.
Diskovery Educational Systems
EarthWalk Communications, Inc.
Ericsson Web Com, Inc.
FOCUS Enhancements, Inc.

Forest Technologies
Gateway
GCC Technologies
Geist Manufacturing, Inc.
Hewlett-Packard Company
IBM Corporation
Interactive Products Division—
  Numonics
Jungsoft USA, Inc.
Keytec, Inc.
Leading Technology Micro, Inc.
Learning Services, Inc.
Lexmark International
LittleFingers by Datadesk
Logical Choice Technologies
Micro Warehouse, Inc.
Network Data Services, Inc.
PAR Technologies, Inc.
Philips Consumer Electronics
Pinnacle Systems, Inc.
Polaroid Education Program
Pre-Owned Electronics, Inc.
Principia Products, Inc.
Proxim, Inc.
QuickPAD by H45 Technology, Inc.
Sagebrush Corporation
SchoolComputer.com
SCI Technologies
SMART Technologies Inc.
Software Express, Inc.
Sorenson Vision, Inc.
Sun Microsystems, Inc.
Symbol Technologies, Inc.
Tangent Computer, Inc.
Terrapin Software
Virtual Ink Corp.
Welsh Products, Inc.
WIN Laboratories, Ltd.
Winnebago Spectrum/Athena
Zenith Electronics Corporation

COMPUTER SERVICE PARTS

Pre-Owned Electronics, Inc.

COMPUTER SUPPLIES

WorldWise Computer Supplies &
  Accessories

COMPUTER SYSTEMS

Alexandria/COMPanion Corporation
Amera Computers, Inc.
Book Systems, Inc.
Brother International Corporation
CalcuScribe
CDW•G
CompUSA Inc.
Daly Computers
Data Recognition, Inc.
DataServ, Inc.
Dell Computer Corporation
EarthWalk Communications, Inc.
Enterasys Networks
Gateway
Hewlett-Packard Company
Howard Computers
IBM Corporation
Leading Technology Micro, Inc.
LearnStar, L.P
Logical Choice Technologies
Micro Warehouse, Inc.
Micron Government Computer
  Systems, Inc.
Network Data Services, Inc.
NoteSys
PAR Technologies, Inc.
Perfect Solutions
Pre-Owned Electronics, Inc.
Premio Computer, Inc.
SCI Technologies
Sun Microsystems, Inc.
Tangent Computer, Inc.
Toshiba America
WIN Laboratories, Ltd.

COMPUTER TELEPHONY

PhoneMaster—a Division of
  US Telecom

COMPUTER-BASED TRAINING

Teknimedia Corporation

CONFERENCES
EBSCO Publishing
Georgia Educational Technology Conference (GaETC)
National School Boards Association
SCI Technologies
Society for Computer Simulation International
WCCE 2001 (World Conference on Computers in Education)

CONSULTING SERVICES
Co-NECT Schools
Funds for Learning
IDE Corp.—Innovative Designs for Education
TeachMaster Technologies

CURRICULUM CONTENT ONLINE
New Forum Publishers, Inc.

DATABASE MARKETING
Quality Education Data

DATABASE SERVICES
Quality Education Data

DESIGN SERVICES
SMARTdesks Ltd.

DIGITAL IMAGING PRODUCTS
Sony Electronics, Inc.

DISTANCE LEARNING
Canter & Associates, Inc.
TeacherEducation.com-Teacher Education Institute
TopTutors.com

DISTANCE LEARNING SERVICES
Bell Atlantic

DISTANCE LEARNING: GRADUATE EDUCATION
Walden University

DVD
AIMS Multimedia
Pioneer New Media Technologies, Inc.

DVD, CD-ROM, VIDEO
Phoenix/BFA/Coronet

EDUCATION
Pepperdine University

EDUCATION PUBLICATIONS
Media & Methods Magazine

EDUCATION SOLUTIONS
Acer America Corporation

EDUCATIONAL CURRICULUM PROGRAMS
USA TODAY

EDUCATIONAL MEDIA DISTRIBUTOR
Library Video Company

EDUCATIONAL PRODUCTS
Pitsco LEGO Dacta

EDUCATIONAL RESOURCES
Cable in the Classroom

EDUCATIONAL SITE
ePALS Classroom Exchange

EDUCATIONAL SOFTWARE: ADMINISTRATIVE
AbleSoft, Inc.
Academic Distributing, Inc.
AccuNet™/AP® Photo Archive
Alexandria/COMPanion Corporation
Altiris
American Education Corporation
Blackboard, Inc.
Boxer Learning, Inc.
CCV Software
Chancery Software Ltd.
ClassroomDirect.com
Computer Curriculum Corporation
Daly Computers
Diskovery Educational Systems
Dukane Corporation
EDmin.com
Educational Resources
Enova Software Inc.
Ericsson Web Com, Inc.
Excelsior Software, Inc.
Follett Software Company
Forest Technologies
FSCreations, Inc.
Funds for Learning
IBM Corporation
IDE Corp.—Innovative Designs for Education
Inspiration Software, Inc.
Jackson Software
Jay Klein Productions
K-12 MicroMedia Publishing
Learning in Motion
Learning Services, Inc.
Learning Tools International
Logic Extension Resources
Logical Choice Technologies
Meridian Creative Group
Micro Warehouse, Inc.
MSCS
NCS
NetSupport
Nordex International
Phoenix Multimedia, Inc.
PhoneMaster—a Division of US Telecom
Power On Software
PowerSchool
Principia Products, Inc.
Regional Technology in Education Consortium
Sagebrush Corporation
Schepp Turner Productions LLP
SchoolComputer.com
Software Express, Inc.
South Central Regional Technology in Education Consortium
Sun Microsystems, Inc.
Surpass Software
Symbol Technologies, Inc.
Teacher Created Materials, Inc.
teachersroom.com, Inc.
TeachMaster Technologies
TechLAN
Virtual Learning Technologies
Vista Associates, Inc.
Winnebago Spectrum/Athena

EDUCATIONAL SOFTWARE: INSTRUCTIONAL
A-ha! Interactive, Inc.
Academic Distributing, Inc.
Academic Software
AccuNet™/AP® Photo Archive
Advantage Learning Systems, Inc.
Adventus Incorporated
AIMS Multimedia
Altiris
American Education Corporation
Animated Communications
ANTEC/Educational Technology Associates & Neufeld Learning Systems
Apex Learning
Applied Technologies
APTE, Inc.
Ask Jeeves/The Evergreen Project
Aurbach & Associates, Inc.
Barnum Software
Blackboard, Inc.
Boxer Learning, Inc.
Brainium.com
Bytes of Learning
Casio, Inc.
CCV Software
Centrinity
Classroom Connect, Inc.
ClassroomDirect.com
Cognitive Concepts, Inc.
College Broadband
CompassLearning
Compu-Teach Educational Software
Computer Curriculum Corporation
CrossTec Corporation
Cubic Science, Inc.
Curriculum Associates, Inc.
Daly Computers
DDC Publishing
Discourse Technologies Inc.
Diskovery Educational Systems
EarthWalk Communications, Inc.
Edmark Corporation
Educational Resources
Educational Software Institute
ELLIS by CALI, Inc.

EDUCATIONAL SOFTWARE: INSTRUCTIONAL (CONTINUED)

Encore Software, Inc.
Entrex Software
Ericsson Web Com, Inc.
Fairfield Language Technologies
Forest Technologies
Gamco/Orchard Software
Get a Clue Software & Services
(Lyceum Communications)
GPN/University of Nebraska-Lincoln
Grolier Educational
Heartsoft
IBM Corporation
IDE Corp.—Innovative Designs
for Education
imind education systems
Ingenuity Works, Inc./
Corel Corporation
Inspiration Software, Inc.
IntelliTools, Inc.
K'NEX Education Division
K-12 MicroMedia Publishing
Key Curriculum Press
LCSI
Learn.com
Learning in Motion
Learning Services, Inc.
Learning Tools International
LearnStar, L.P
Lexia Learning Systems, Inc.
Library Video Company
Lightspan, Inc.
Lintor Publishing Center
Logic Extension Resources
Logical Choice Technologies
Macromedia, Inc.
Main Xchange, Inc.
Math.com
MathResources Inc.
MathXpert
McGraw-Hill Learning Technologies
Micro Warehouse, Inc.
Micrograms Software
Milliken Publishing Co.
National Geographic
School Publishing
NCS
NEC Systems, Inc.
NECTAR Foundation
NetSupport
NewDeal, Inc.
Nortel Networks
NoteSys
Optimum Resource, Inc.
Phoenix Multimedia, Inc.
Pitsco LEGO Dacta
PLATO® Education/TRO Learning, Inc.
Quick Course® Books/OTSI
Rainbow Educational Media
Regional Technology in
Education Consortium
SAS inSchool
Scholastic Inc.
SchoolComputer.com
SCI Technologies
SMART Technologies Inc.
Software Express, Inc.
Sonic Desktop Software
South Central Regional Technology
in Education Consortium
Steck-Vaughn
Sun Microsystems, Inc.
SUNBURST Technology
T.H.E. Journal
Teacher Created Materials, Inc.
Teacher Support Software
Teacher Universe, Inc.
teachersroom.com, Inc.
Teknimedia Corporation
Terrapin Software
Texas Instruments Incorporated
textHELP Systems Ltd.
The LearningStation.com
The Princeton Review Online
The Wright Group
ThinkQuest
Tom Snyder Productions
TopTutors.com
Turner Learning, Inc.
Tyndal Stone Media

U.S.News & World Report
Vernier Software & Technology
Virtual Learning Technologies
Winnebago Spectrum/Athena
Yamaha Corporation of America

EDUCATIONAL TECHNOLOGY

K'NEX Education Division
Knowvation, Inc.

ELECTRONIC LEARNING AID

Educational Insights
Learning Advantage

EMERGING EDUCATIONAL TECHNOLOGIES PRODUCTS & SERVICES

DataServ, Inc.

FOUNDATIONS

Computer Learning Foundation
SMARTer Kids Foundation

FUNDRAISING

The FundingFactory

GOALS, STANDARDS & BENCHMARKS ACHIEVEMENT TRACKING

Learning Tools International

GOVERNMENT

U.S. Geological Survey

GOVERNMENT SERVICES

National Science Foundation

GRAPHIC DESIGN

Adobe Systems Inc.

GRAPHING CALCULATORS

Casio, Inc.

HARD DRIVE PROTECTION

Centurion Technologies, Inc.

HARD-DISK UTILITIES

PowerQuest Corporation

INSTRUCTIONAL HARDWARE

The Keyboard Instructor by AKT Inc.

INSTRUCTIONAL TRAINING AND DEVELOPMENT SERVICES

Bell Atlantic

INTELLIGENT KEYBOARD

CalcuScribe

INTERACTIVE WHITEBOARDS

Interactive Products Division—Numonics
SMART Technologies Inc.

INTERCOM

Dukane Corporation

INTERNET PRODUCTS/SERVICES

A-ha! Interactive, Inc.
Academic Distributing, Inc.
America Online, Inc.
American Education Corporation
American School Directory
Apex Learning
APTE, Inc.
AT&T Learning Network
Ask Jeeves/The Evergreen Project
Bell Atlantic
BellSouth
bigchalk.com, inc.
Bonus.com the SuperSite for Kids
Boxer Learning, Inc.
Brainium.com
Britannica Education
CCV Software
Centrinity
ChildU, Inc.
Classroom Connect, Inc.
College Broadband
Computer Curriculum Corporation
Computer Learning Foundation
CyberPatrol, Unit of
The Learning Company
Daly Computers
DataServ, Inc.
Discovery Channel School
Diskovery Educational Systems
e-Tutor, Inc.
EarthWalk Communications, Inc.

INTERNET PRODUCTS/SERVICES (CONTINUED)

eBoard.com
EBSCO Publishing
EDmin.com
Educational Software Institute
eHomeRoom.com, Inc.
Enova Software Inc.
ePALS Classroom Exchange
Excelsior Software, Inc.
FamilyEducation Network
Follett Software Company
Forest Technologies
Fortres Grand Corporation
Get a Clue Software & Services
(Lyceum Communications)
GPN/University of Nebraska-Lincoln
Grolier Educational
Heartsoft
Hewlett-Packard Company
HighWired.com
IBM Corporation
IDE Corp.—Innovative Designs
for Education
imind education systems
INET Library
Ingenuity Works, Inc./
Corel Corporation
Intel Corp.
Internet Products, Inc.
iTeach.com
JDL Technologies
K-12 MicroMedia Publishing
Leading Technology Micro, Inc.
Learn.com
Learning in Motion
Learning Pays.com
Learning Services, Inc.
Learning Tools International
LearnStar, L.P
Lightspan, Inc.
Lintor Publishing Center
Logic Extension Resources
Logical Choice Technologies
Main Xchange, Inc.
Math.com
Micro Warehouse, Inc.
Microsoft Corporation
N2H2, Inc.
NASA Education Program
National Geographic
School Publishing
NCS
NECTAR Foundation
NetSchools Corporation
New Forum Publishers, Inc.
NewDeal, Inc.
NewsBank, Inc.
Novell, Inc.
Philips Consumer Electronics
Phoenix Multimedia, Inc.
Phoenix/BFA/Coronet
PLATO® Education/TRO Learning, Inc.
Principia Products, Inc.
Proxim, Inc.
Quick Course® Books/OTSI
Regional Technology in
Education Consortium
Riverdeep Interactive Learning
Sagebrush Corporation
Scholastic Inc.
School Center
School Improvement.Net
SchoolOne.com
SCI Technologies
Security Software Systems, Inc.
SIRS Mandarin, Inc.
SmartStuff Software
Software Express, Inc.
Sonic Desktop Software
Sorenson Vision, Inc.
South Central Regional Technology in
Education Consortium
Sun Microsystems, Inc.
Symantec Corporation
Teacher Created Materials, Inc.
teachersroom.com, Inc.
Teknimedia Corporation
Test University
The FundingFactory
The LearningStation.com
The Princeton Review Online

ThinkQuest
Tom Snyder Productions
TopTutors.com
Turner Learning, Inc.
U.S.News & World Report
Virtual Ink Corp.
Virtual Learning Technologies
Vista Associates, Inc.
VTEL Corporation
Winnebago Spectrum/Athena
Youthline USA
ZapMe! Corporation

IT SOLUTIONS
Fiberworks, Inc.

LAN/WAN INTEGRATION SERVICES
Bell Atlantic

LAPTOP COMPUTERS
DreamWriter—NTS Computers

LIBRARY AUTOMATION
Alexandria/COMPanion Corporation
Book Systems, Inc.
Follett Software Company
SIRS Mandarin, Inc.
Surpass Software

MAGAZINE
Teaching K-8 Magazine

MAILING LIST COMPILER OF EDUCATION MAILING LISTS
Market Data Retrieval

MANAGED INTERNET
New Forum Publishers, Inc.

MANUFACTURER
National Semiconductor Corporation

MARKET RESEARCH
Quality Education Data

MEDIA
CompUSA Inc.

MEDIA RETRIEVAL
Rauland-Borg Corporation

MONTHLY NEWSPAPER
School Reform News—
The Heartland Institute

MULTIMEDIA
Pioneer New Media Technologies, Inc.

MULTIMEDIA AUTHORING SOFTWARE
MediaSmith, Inc.

MULTIMEDIA PROCESSING
MediaSmith, Inc.

MUSIC EDUCATION HARDWARE & SOFTWARE
Yamaha Corporation of America

NETWORK MANAGEMENT SERVICES
Bell Atlantic

NETWORK MANAGEMENT SYSTEM
MSCS

OMR, ASSESSMENT SOFTWARE
Principia Products, Inc.

ON-LINE RETRIEVAL SERVICES
Bogen Communications, Inc.
Boxer Learning, Inc.
Classroom Connect, Inc.
Dukane Corporation
Follett Software Company
NewsBank, Inc.
Phoenix Multimedia, Inc.
The LearningStation.com
Zenith Electronics Corporation

ONE-TO-ONE ONLINE TUTORING
TopTutors.com

ONLINE COMPUTER-RELATED DEGREE PROGRAMS
Nova Southeastern University, SCIS

PC TO TV SCAN CONVERTERS
FOCUS Enhancements, Inc.

PHOTO ID SYSTEM
Vision Database Systems

PORTABLE WORD PROCESSOR
CalcuScribe

PRINTING SUPPLIES
thINK4inc.com

PROFESSIONAL DEVELOPMENT
AT&T Learning Network
FUTUREKIDS, Inc.
Knowvation, Inc.
School Improvement.Net

PROFESSIONAL DEVELOPMENT TRAINING
IDE Corp.—Innovative Designs for Education

PROGRAMMING LANGUAGES
Academic Distributing, Inc.
DDC Publishing
Diskovery Educational Systems
Educational Software Institute
K'NEX Education Division
NewDeal, Inc.
Software Express, Inc.
Sun Microsystems, Inc.
Terrapin Software

PROJECTION DEVICES
ANTEC/Educational Technology Associates & Neufeld Learning Systems
Boxlight Corporation
Canon USA Visual Communication Systems
CCV Software
CompUSA Inc.
Daly Computers
Data Projections, Inc.
Diskovery Educational Systems
Dukane Corporation
EarthWalk Communications, Inc.
Interactive Products Division—Numonics
LIGHTWARE
Long's Electronics Inc.
Philips Consumer Electronics
Proxima Corporation
SchoolComputer.com
SMART Technologies Inc.
WIN Laboratories, Ltd.
Zenith Electronics Corporation

PROTECTION
Jungsoft USA, Inc.

PUBLISHER
Adventus Incorporated
American Education Corporation
Ask Jeeves/The Evergreen Project
Barnum Software
Britannica Education
Bytes of Learning
Canter & Associates, Inc.
Children's Software Press
Computer Learning Foundation
Computer Literacy Press, Inc.
Cubic Science, Inc.
Curriculum Administrator Magazine
Curriculum Associates, Inc.
DDC Publishing
Discovery Channel School
Education Week
Gamco/Orchard Software
Get a Clue Software & Services (Lyceum Communications)
Glencoe/McGraw-Hill
GPN/University of Nebraska-Lincoln
Greenwood Publishing Group
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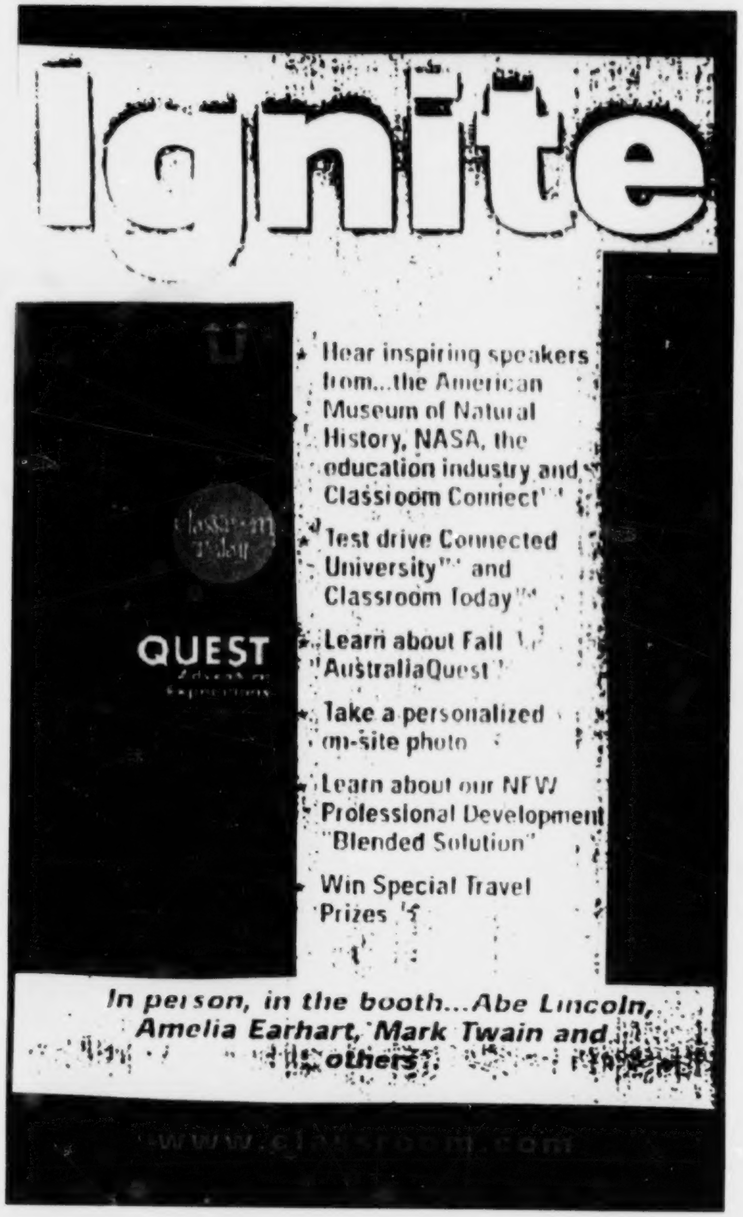
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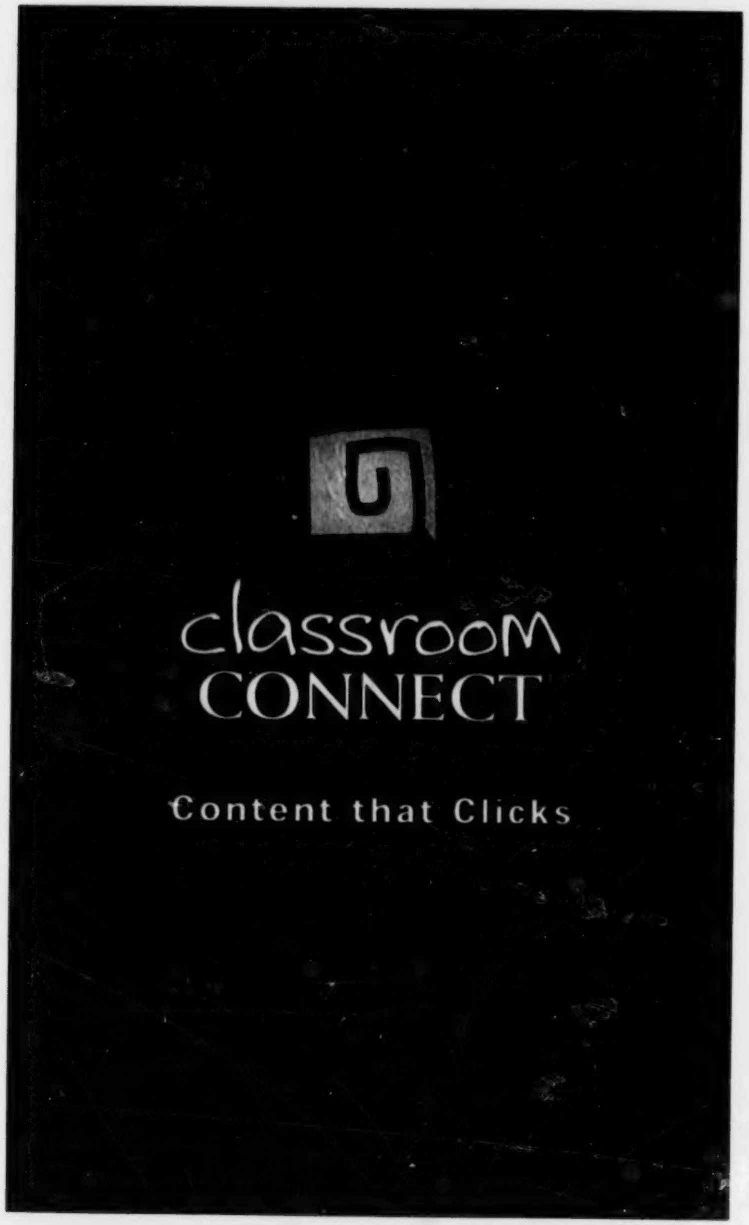

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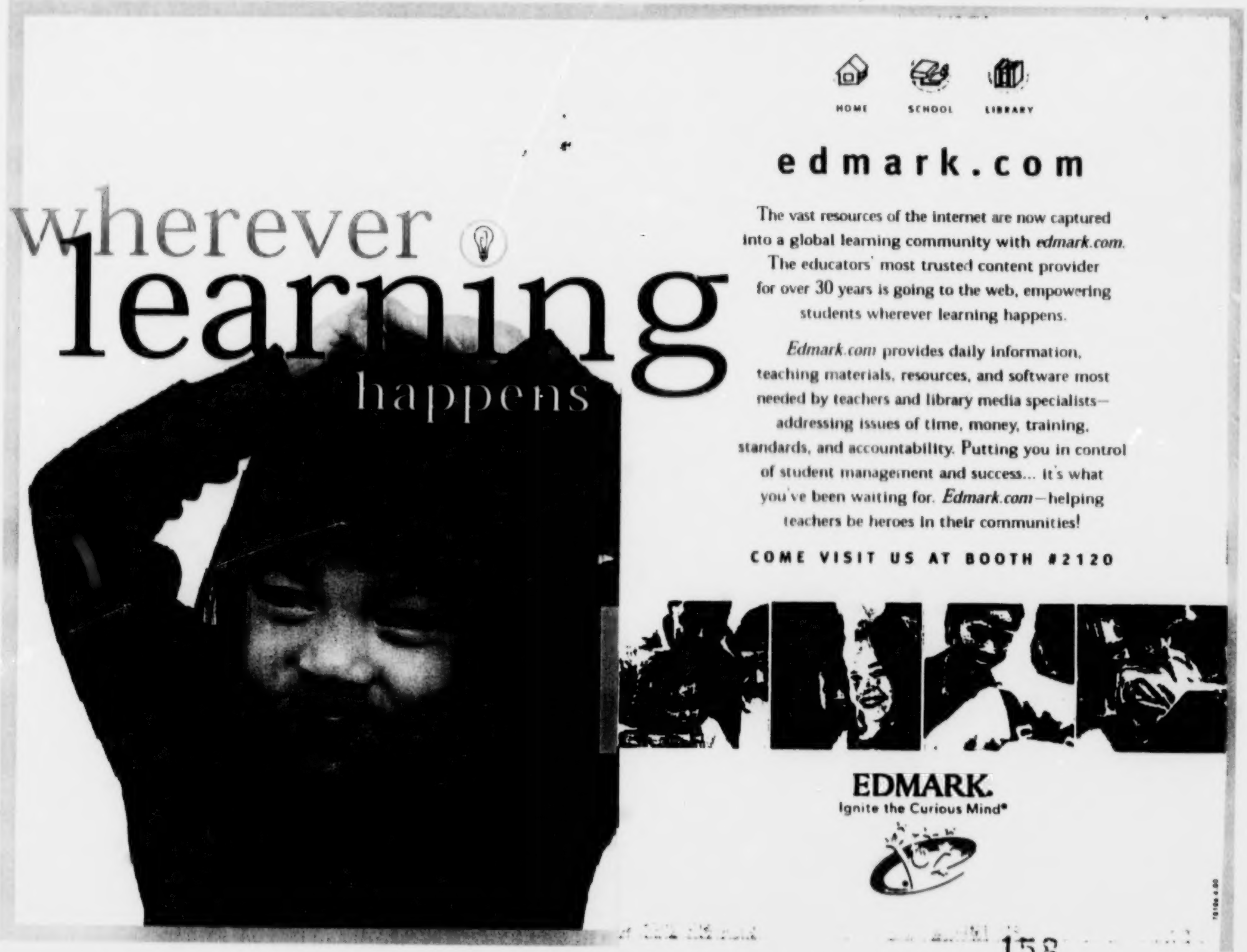

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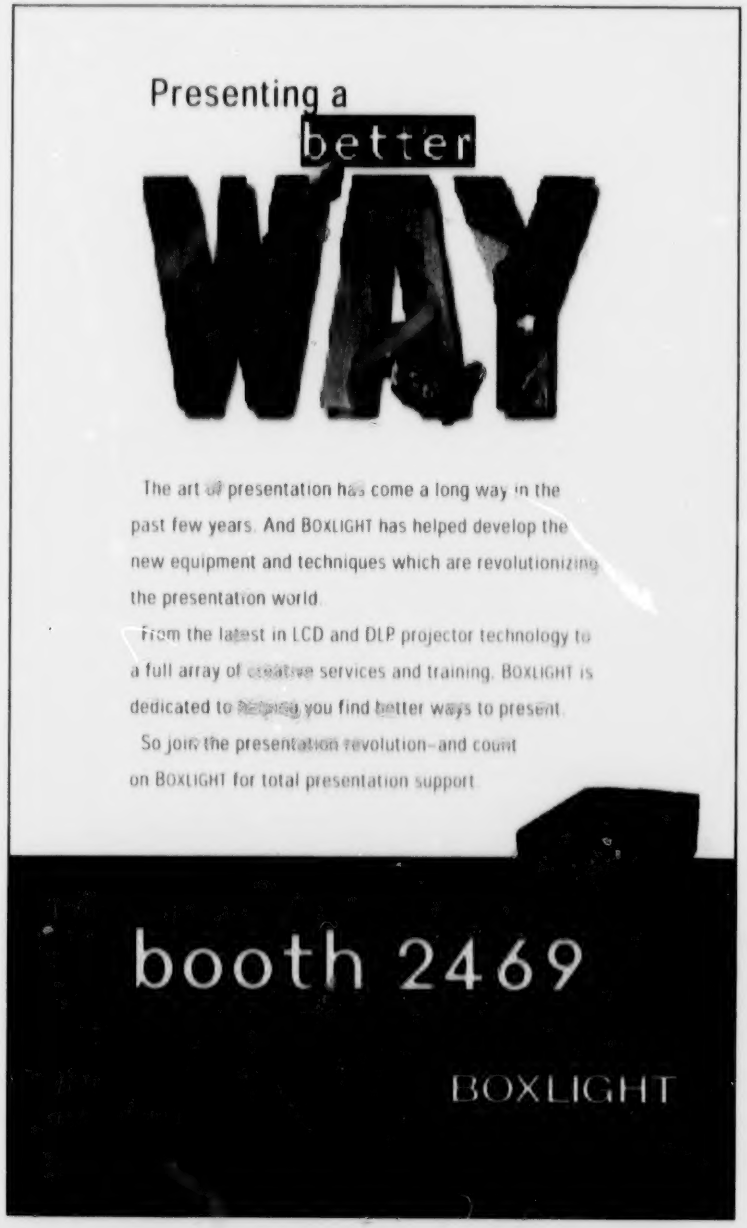

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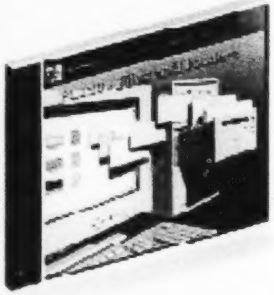

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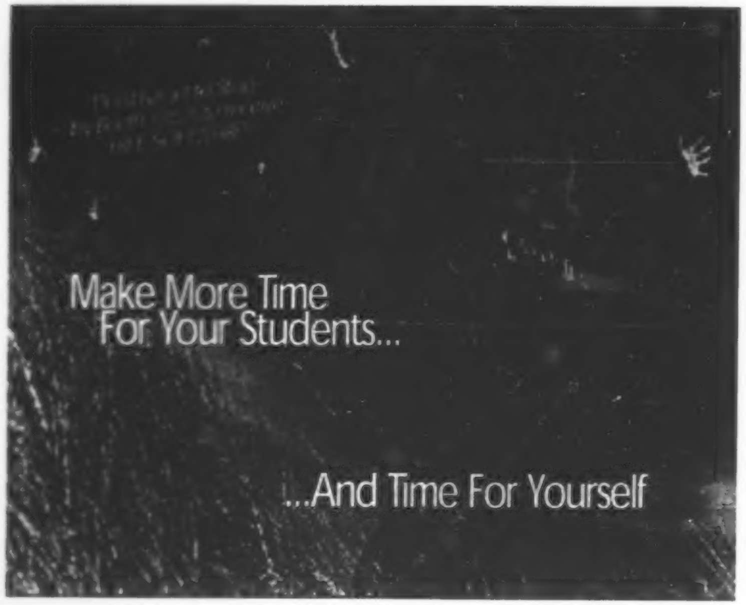

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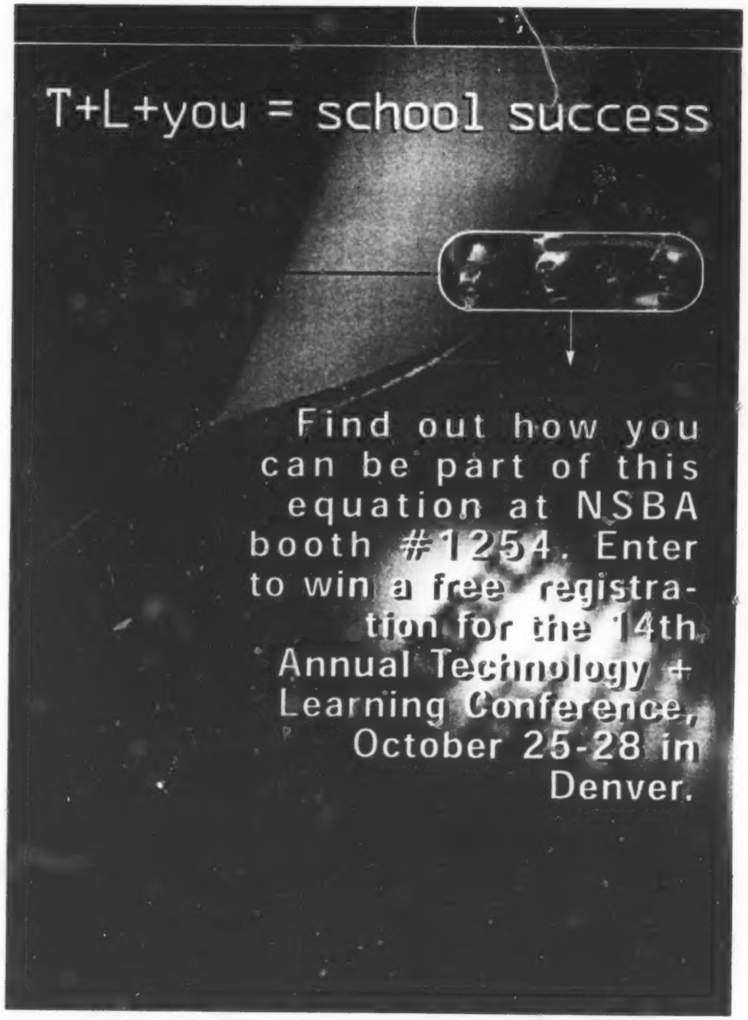

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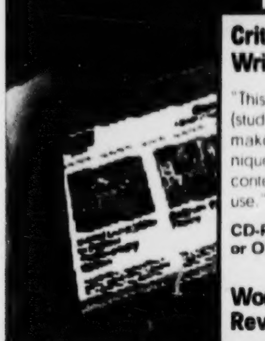

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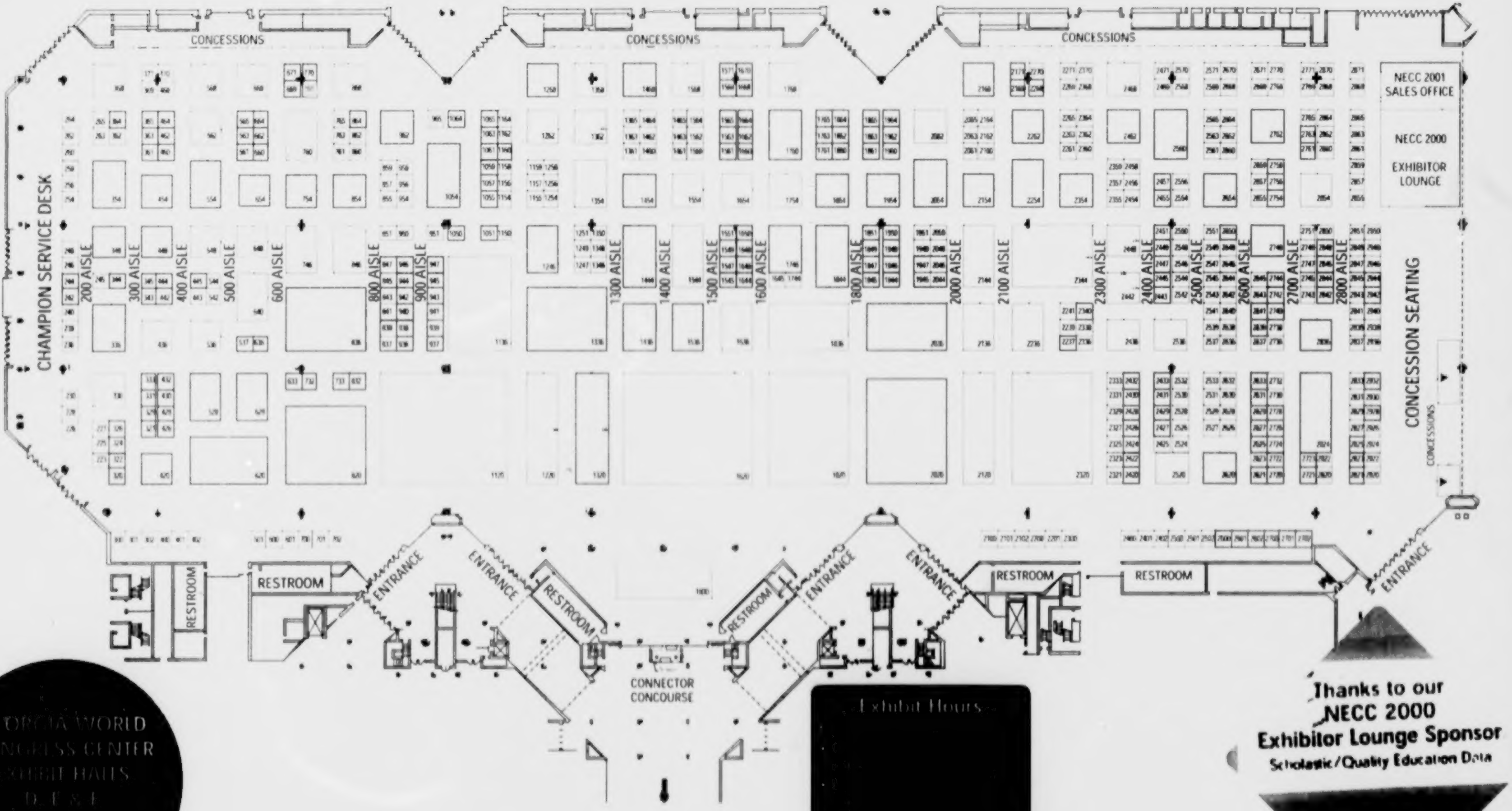
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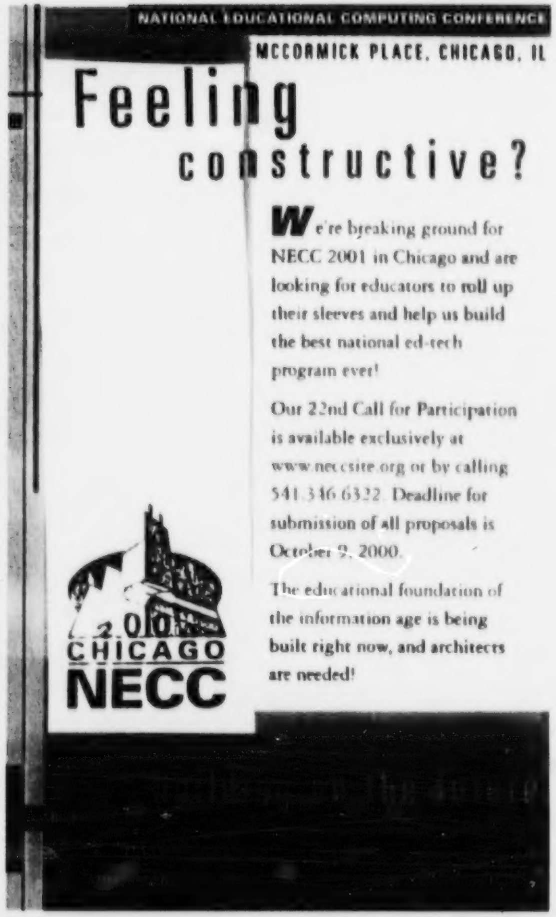

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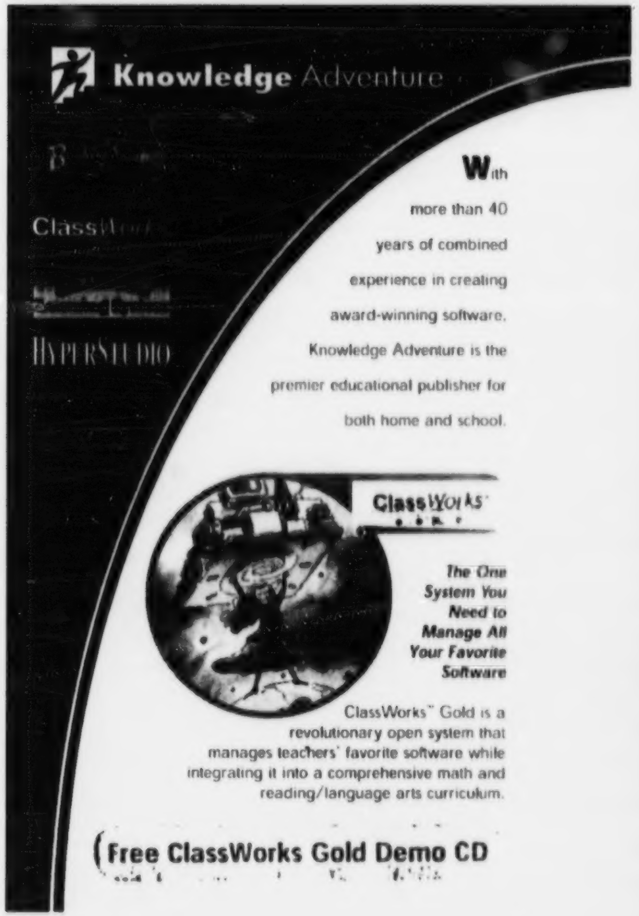

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NECA Member Societies-2000

These descriptions are provided for the 14 professional societies/associations that belong to the National Educational Computing Association (NECA). Contact information for each society's NECA representative is given following the society's description. Information about each society can also be found on the NECA Web site (www.neccsite.org).

ISTE-International Society for Technology in Education

The International Society for Technology in Education (ISTE) is the largest teacher-based, nonprofit organization in the educational technology field. Its official mission is "to promote appropriate uses of information technology to support and improve learning, teaching, and administration at the K-12 levels and in teacher education."

ISTE publications focus on the effects of computers, software, and other technologies on classroom teaching, curriculum, and teacher education. Learning & Leading with Technology (L&L), ISTE's monthly magazine, spotlights practical classroom uses of computer hardware and software. ISTE's monthly online newsletter, ISTE Update, keeps members in touch with recent news and trends in educational technology. The Journal of Research on Computing in Education (JRCE), as well as ISTE's other scholarly journals, assists teachers in determining research-supported directions for technology initiatives. ISTE also publishes a wide range of books for teachers interested in enhancing instructional uses of computers at the precollege level. These publications now include the nationally recognized Generation www.Y materials as well as the National Education Technology Standards for student achievement in Grades K-12.

Major components of ISTE's teacher-outreach programs include:

- Teacher-led workshops at major conferences, offering hands-on approaches to new instructional technologies
- ISTE-sponsored conferences and leadership symposia that provide teachers with enhanced career development opportunities
- National representation in Washington with regular updates to members on issues such as E-rate and other initiatives that affect technology and education
- National accreditation standards for applying information technology in education, developed by ISTE for NCATE and NETS
- Networking through ISTE's Special Interest Groups (SIGs) that link tech coordinators, computer science educators, Logo users, telecommunications educators, hypermedia/multimedia users, and others
- More than 50 local and regional Affiliates, organizations whose members support ISTE goals and distribute ISTE information through their newsletters, conferences, and membership meetings

Contact: ISTE Customer Service Office, 800.336.5191, fax: 541.302.3778, iste@iste.org, www.iste.org

ISTE SIGTC-Special Interest Group for Technology Coordinators

The Special Interest Group for Technology Coordinators (SIGTC) is a professional organization that helps technology coordinators meet the challenges of a rapidly changing field. We provide an excellent forum to identify problems and solutions, and share information on issues facing technology coordinators at the precollege level.

SIGTC publishes SIGTC Connections through the International Society for Technology in Education (ISTE). Articles in SIGTC Connections contain helpful information and answers to questions such as:

- What are some ways technology coordinators are successfully organizing and communicating with teachers and administrators?
- What strategies are technology coordinators using to enlist the support of school boards and administrators?
- How do technology coordinators keep informed of new trends and developments in this rapidly changing field?

For general information, contact ISTE (see preceding). For information on ISTE's SIGTC, contact Bonnie Marks, Alameda County Office of Education, 313 W. Winton, Hayward, CA 94544.

ISTE SIGTE-Special Interest Group for Teacher Educators

SIGTE is the ISTE Special Interest Group for Teacher Educators involved in educational technology. SIGTE provides a forum for members to share successes, raise questions, and meet the challenges of helping other professionals use technology to enhance learning and education. SIGTE publishes a quarterly journal, the Journal of Computing in Teacher Education (JCTE), that works to provide its members with the answers to practical, leadership, research, and theoretical questions, such as:

- What is happening in K-12 computer education that relates to teacher education programs?
- What funding issues are in the forefront of current preservice and inservice teaching areas?
- What are the directions in teacher education as related to computer and technology education?
- How can educators become effective critics and implementers of innovations using technology?

Each year, SIGTE gives a cash award at NECC for the best paper describing research on technology in teacher education; the paper is presented at the conference.

For general information, contact ISTE (see preceding). For information on ISTE's SIGTE, contact Judy Robb, University of New Hampshire, Department of Education, Morrill Hall, Durham, NH 03824, jkull@christa.unh.edu.

AAHE/The TLT Group-American Association for Higher Education/The Teaching, Learning, and Technology Group

AAHE is a membership association of individuals interested in improving the effectiveness of the higher education enterprise as a whole and their own effectiveness in their particular setting. The association's membership includes more than 8,000 administrators, faculty, and students from all sectors, as well as policy makers and leaders from foundations, business, and government.

AAHE is higher education's citizen's organization, in which individuals step beyond their special roles to collectively address the challenges higher education faces. Members share two convictions: that higher education should play a more central role in national life, and that each of our institutions can be more effective. AAHE helps members translate these convictions into action.

Through conferences, publications, and special-interest projects, members acquire both the "big picture" and the practical tools needed to increase their effectiveness in their own setting and to improve the enterprise as a whole.

Contact: Steven Gilbert, AAHE/The TLT Group, One Dupont Circle, Suite 360, Washington, DC 20036-1110, gilbert@tltgroup.org, www.tltgroup.org

ACM/SIGCAS-Special Interest Group on Computers and Society

With a membership of approximately 1,000, this professional group seeks to identify social and ethical issues raised by computer technology and provide a forum for examining these issues. SIGCAS was one of the sponsors of the ACM Policy98 Conference held in Washington, D.C., which brought together computer professionals and government policy makers to discuss the critical technology issues that affect social policy.

SIGCAS publishes a quarterly newsletter, Computers and Society, which is a primary source of material on this topic. As a vehicle of communication for the SIGCAS membership, the newsletter includes news, comments, and articles on societal issues raised by computing technology. One of the few periodicals on this subject, it provides a flexible and timely forum for important, evolving topics, such as privacy, equity of access, de-skilling of the workplace, regulation of the Internet, and intellectual property rights. There are also monthly educational columns that include ethics scenarios and case studies, pedagogical ideas, and reviews of new textbooks in the area of ethics and social effects that are useful for high school, community college, and university educators.

According to a recent membership survey, about 40% of SIGCAS members teach course material on computers and society. In recent years, SIGCAS has organized sessions at computer conferences on new methods for teaching the ethical and social effects of computers.

Contact: C. Dianne Martin, CS Department, George Washington University, 7th Floor, Academic Center, Washington, DC 20052, diannem@seas.gwu.edu

ACM/SIGCSE-Special Interest Group on Computer Science Education

SIGCSE became a special interest group of ACM in 1970. It currently consists of more than 2,000 members from educational, industrial, and governmental communities interested in various aspects of computer science education. SIGCSE has goals of encouraging and assisting in the development of effective academic programs and courses in computer science, and promoting research in computer science education.

The following are objectives of SIGCSE:

1. To provide a continuing forum for discussion of common problems among education and other computer scientists through organized meetings and symposia.
2. To publish a bulletin at least quarterly containing information aimed specifically at those interested in computer science education.
3. To work closely with the Education Board of ACM to ensure implementation of effective education programs by the association.

Contact: Harriet Taylor, ELRC-111 Peabody Hall, Louisiana State University, Baton Rouge, LA 70803, taylor@asterix.ednet.lsu.edu

ACM/SIGCUE-Special Interest Group on Computer Uses in Education

SIGCUE provides a forum for the discussion of ideas, methods, and policies related to all aspects of computers in the educational process. Established in 1969, its membership (more than 1,400 persons) comes from many countries and numerous, diverse institutions and businesses.

SIGCUE publishes a newsletter, SIGCUE Outlook. Recent topics have included preservice education in educational computing, international reports on educational computing, and a teacher training curriculum project. SIGCUE also sponsors and organizes technical sessions at ACM annual meetings, the National Educational Computing Conference, and other national and regional meetings of interest to its members.

Among SIGCUE's goals are:

1. Helping to bring the technical expertise within ACM to bear upon educational computing generally.
2. Cooperating with other special interest groups or educational societies to promote attention to educational computing issues.
3. Providing written and verbal forums for members and the educational community to exchange ideas concerning computer uses in education.

Contact: Karen Gould, Metro School District of Wayne Township, 1220 S. High School Drive, Indianapolis, IN 46241

ACM/SIGUCCS-Special Interest Group on University and College Computing Services

SIGUCCS provides a forum for those involved in providing computing services on a college or university campus. The topics addressed by SIGUCCS include managing campus computing, computing as it relates to the overall goals of the institution, and the state of the art in various types of college and university computing services. SIGUCCS provides opportunities to discuss and share ideas and experiences with others.

Two annual conferences are regular activities of SIGUCCS. The Computing Center Management Symposium addresses the many aspects of managing computing on campus. This includes hardware, software, planning, finances, and personnel, to name few. The User Services Conference covers more directly the delivery of particular services to the higher education community. Tutorials on relevant issues are held at both conferences.

In other projects, SIGUCCS offers a peer review of the university computing function. Upon request of the computer center director, members of SIGUCCS will formally analyze and comment on different areas of the campus computing function. SIGUCCS also publishes a quarterly newsletter. We consider the newsletter our most important form of communication because it reaches all members and is subscribed to by numerous university computing centers. Conference proceedings are published either as separate documents or as part of the newsletter itself.

Contact: Chuck Chulvick, Raritan Valley Community College, Box 3300, Somerville, NJ 08876, 908.526.1200, ext. 8409, cchulvic@raritanval.edu

AECT-The Association for Educational Communications and Technology

The Association for Educational Communications and Technology (AECT) is an international professional association dedicated to the improvement of instruction at all levels through the appropriate use of instructional technology. AECT's purpose is to promote the effective design and use of technologies in the teaching/learning process, worldwide.

Founded in 1923, AECT has evolved as an organization as the technology used in education has evolved, from the early use of traditional audiovisual media to today's interactive and multimedia technology platforms. AECT members can be found at all levels of public and private education, from elementary schools to colleges and universities, as well as in the corporate and government sectors.

Organizationally, AECT has 7 special interest divisions and 5 councils. Affiliates include 8 chapters, 46 state affiliate organizations, and 14 national and international affiliate organizations. With more than 4,000 members, AECT is the largest international association for professionals involved in the integration of instructional technology in to the learning process. AECT is the United States representative to the International Council for Educational Media (ICEM).

Tech Trends is the association's professional periodical. Published during the school year, Tech Trends features authoritative, practical articles about technology and its integration in to the learning environment. Educational Technology Research and Development (ETR&D), the association's research quarterly, is the only refereed journal focusing entirely on research and instructional development in the rapidly changing field of educational technology.

AECT also publishes reference books on a variety of topics, including practical applications of technology, research, copyright, and standards and guidelines for the field of special interest to instructional technologists.

The AECT annual convention is held in February, drawing participants from around the world. Additionally, AECT sponsors an annual summer institute for leaders within AECT and its affiliates.

Contact: Phil Harris, AECT Executive Director, 1800 N. Stonelake Drive, Suite 2, Bloomington, IN 47404, pharris@ait.net, 812.335.7675, fax: 812.335.7678

CCSC-Consortium for Computing in Small Colleges

CCSC is a nonprofit organization focused on promoting effective use of computing in smaller institutions of higher education that are typically nonresearch in orientation. It supports activities that assist faculty in such institutions to make appropriate judgments concerning computing resources and educational applications of computer technology.

Because departments in smaller colleges and universities are usually small and not highly specialized, the consortium encourages the sharing of expertise, effective curriculum patterns, and efficient technological applications. The consortium is concerned with the advancement of major programs in both computer science and computer information systems, and with the use of computers in the liberal arts and sciences.

The Journal of Computing in Small Colleges is distributed to faculty at more than 400 colleges across the country. Now in its seventh volume, its five annual issues are averaging 500 pages, with articles addressing the broad spectrum of curriculum and computer use in higher education.

Contact: Gail Miles, Lenoir-Rhyne College, Box 7482, Hickory, NC 28603, miles@lrc.edu

CoSN-Consortium for School Networking

The Consortium for School Networking is a nonprofit organization formed to further the development and use of telecommunications in K-12 education. CoSN provides a dynamic forum for educational, institutional, and corporate organizations that share the goal of promoting state-of-the-art computer networking technology in schools. By working together through CoSN, these separate groups form a powerful national voice focused on realizing the promise of K-12 networking.

CoSN has identified three areas of work that are key to fulfilling its mission:

1. Leadership Enhancement: CoSN will engage in programs and activities to improve the capabilities of those in leadership positions at the national, state, and local levels to ensure that information technology has a direct and positive effect on student learning.
2. Advocacy: CoSN will maintain a strong and effective voice in policy formation and implementation at the federal level to ensure that law and policy at the federal level serve the interests of all students in our schools.
3. Coalition Building: CoSN will actively foster partnerships and collaborate with other organizations, government agencies, and businesses to improve access, equity, the performance of networking technology in schools, the effect of information technology on student learning, and teacher productivity.

CoSN's activities for accomplishing this work are many. Its annual K-12 Networking Conference has become the premier forum on telecommunications in the classroom by bringing together key players from national, state, and local education, corporations, and government to focus on the most important current issues in K-12 networking. Electronic newsletters and member alerts give up-to-the-minute announcements on K-12 networking issues with specific legislative updates from legislative consultant Leslie Harris. CoSN's award-winning Web site at www.cosn.org offers educators a one-stop resource for information on K-12 networking trends and developments. COSNDISC, a moderated online discussion open to everyone on the Internet, serves as a meeting place for everyone interested in school networking.

Contact: Toni Miller, Membership Director, 202.466.6296, ext. 15, infor@cosn.org

EDUCAUSE-Transforming Education Through Information Technologies

The mission of EDUCAUSE is to help shape and enable transformational change in higher education through the introduction, use, and management of information resources and technologies in teaching, learning, scholarship, research, and institutional management.

The incorporation of EDUCAUSE in 1998 was the result of a consolidation of two prominent educational technology associations-CAUSE and Educom-that recognized an increasing convergence in their missions and goals. The association's focus encompasses the management and use of instructional, research, administrative, and library computing; telecommunications and networking; and administration of this enterprise.

Today, librarians, faculty, presidents, deans, registrars, business officers-most of the campus community-use technology-based information resources and are concerned with using them more effectively and efficiently. The professionals who plan for and manage such resources are challenged to fully leverage the significant investment their campuses have made in them, supporting the growing information needs of staff, faculty, and students, while positioning their institutions for the future. EDUCAUSE provides the leadership, information, professional development, and services our members need to achieve this end.

Membership in EDUCAUSE is open to institutions of higher education, corporations serving the higher education information technology market, and other related associations and organizations. EDUCAUSE provides benefits to both the institutions/organizations and their individual representatives who participate in our activities and use our programs and services, including professional development opportunities, publications, strategic policy initiatives, and information services.

Contact: EDUCAUSE, 303.449.4430, info@educause.edu, www.educause.edu/

IEEE-Computer Society

The Computer Society is the world's largest association of computing professionals, with a total membership of approximately 108,000 computer scientists, computer engineers, and interested professionals. Society membership is open to IEEE members, associate members, student members, and non-IEEE members who qualify for affiliate membership. An affiliate member is a person who has achieved status in his or her chosen field of specialization and whose interests focus on the computing field.

Every Computer Society member receives Computer, a peer-reviewed monthly magazine of general interest to computing professionals that also covers society news and events. Nine specialized magazines and eight transactions are also available to society members as optional subscriptions, and to nonmembers, libraries, and organizations.

Magazines published by the Computer Society include IEEE Computer Graphics and Applications, IEEE Micro, IEEE Design and Test, IEEE Software, IEEE Expert, IEEE Annals of the History of Computing, IEEE Multimedia, and IEEE Parallel Distributed Technology. Research-oriented transactions include IEEE Transactions on Computers, IEEE Transactions on Software Engineering, IEEE Transactions on Pattern Analysis and Machine Intelligence, IEEE Transactions on Knowledge and Database Engineering, IEEE Transactions on Parallel Distributed Systems, IEEE Transactions on VLSI Systems, and IEEE Transactions on Visualization and Computer Graphics. The Computer Society Press publishes nonperiodical literature, including tutorial texts and conference records. The society's catalog contains approximately 900 titles that are available for purchase.

The society sponsors or co-sponsors more than 100 conferences and meetings ranging from workshops and symposia with a few dozen participants to major conferences with many thousands of attendees. More than 30 technical committees offer the opportunity to interact with peers in technical specialty areas, receive newsletters, and conduct conferences and tutorials.

The Computer Society has more than 100 local chapters throughout the world and an additional 100-plus student chapters that provide the opportunity to interact with local colleagues and hear experts discuss technical issues. In addition, tutorials, educational activities, accreditation of computer science and engineering academic programs, the development of standards, and an international electronic mail network all play prominent roles in the society's activities.

Contact: Allen Parrish, Department of Computer Science, The University of Alabama, Box 870290, Tuscaloosa, AL 35487-0290, 205.348.3749, fax: 205.348.0219, parrish@cs.ua.edu

SCS-Society for Computer Simulation, International

The Society for Computer Simulation, International (SCS) is the only technical society devoted primarily to the advancement of simulation and allied technology. It has a worldwide membership and a network of regional councils that covers the United States, Canada, the United Kingdom, Europe, and the Pacific Rim.

Simulation is used in every scientific and technical discipline, including aerospace, biomedical, business, education, engineering, and manufacturing. Areas that have been specifically recognized as important to SCS members include artificial intelligence, computer-aided design and manufacturing (CAD/CAM), education, environmental issues, knowledge-based systems, robotics, simulators, and standards.

The society publishes Transactions of SCS, a quarterly archival journal, and SIMULATION, a monthly journal of applications of simulation.

In addition to the flagship Summer Computer Simulation Conference (SCSC), the society sponsors several other conferences, including the SCS Western Multiconference, the SCS Eastern Multiconference, the Winter Simulation Conference, and the European Simulation Symposium.

Contact: Society for Computer Simulation International, PO Box 17900, San Diego, CA 92177-7900, 619.277.3888, fax: 619.277.3930, info@scs.org, www.scs.org/

NECA representative contact: Charles Shub, Computer Science Department, University of Colorado-Colorado Springs, Colorado Springs, CO 80933, cdash@cs.uccs.edu, 719.593.3492, fax: 719.262.3369, www.cs.uccs.edu/~cdash

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Research Paper: Connecting Technology to Teaching and Learning

Interactive Computer Models for Science Education

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Key Words: **computer models, interactive learning, science education**

Abstract

At Marshall University, science faculties are developing computer-based interactive multimedia models for high-school students. These models are designed to promote and enhance science education among high-school students and help high-school teachers utilize computer technology in the classroom. This paper describes a development project funded by the government of the state of West Virginia for the last three years. The developed models are designed to promote science education in remote Appalachian high schools that lack ready access to either extensive laboratory equipment or computer resources. The paper describes the computer models and highlights the authors' experience working with high-school teachers.

Introduction

Concepts of teaching and learning, such as interactive learning, fostering critical thinking, and pragmatic teaching, have taken a major role in education, especially in the fields of science (Miller & Cheetham, 1990; Trimbur, 1989). Many educational organizations, such as the National Association for the Advancement of Science and the National Research Council, are calling for interactive learning and the involvement of both high school and college students in investigative/interactive learning of science (Soloway et al., 1997). To increase the knowledge of science and promote interest and enrollment of high-school students in basic sciences, these organizations recognize and stress the need for new techniques for teaching traditional science concepts in an innovative and stimulating manner.

In West Virginia, the state government is motivating a reform of science and technology education in high schools. The state government is actively funding projects that lead to innovative teaching techniques using current computer technology. The goal is to bring a change in how students learn course content and become active learners with critical- and creative-thinking abilities.

Faculties at Marshall University have been active participants in the reform process. The authors developed a set of computer-based interactive multimedia models to promote science education. The models are used by a selected group of high schools in the state, and are taught by science teachers in a variety of courses including Coordination and Thematic Science, Environmental Earth Science, Chemistry, Honors Chemistry, Applied Biology, Advanced Biology, AP Biology, Anatomy, and Independent Study. Using these models, students work with real-world scenarios and learn the science behind those scenarios. The models interactively teach students the concepts of basic sciences using a multidisciplinary approach. The rest of the paper addresses salient features of the developed models and how they help increase students' learning of science concepts.

The Computer Models

For the last three years, the authors received funding to develop, for high-school students, intuitive and interactive computer-based simulation models for learning the process of scientific analysis behind real-world scenarios. The authors are working with high-school teachers to help them utilize the developed models and computer technology in the classroom. The primary objectives of the models are to:

1. promote interactive science education among high-school students,
2. provide a mechanism of experiencing the process behind real-life scientific analysis methods that would otherwise not be possible because of limited resources,
3. provide a high level of interactivity so that the students feel involved in the process, and
4. increase students' interest and enrollment in basic sciences.

In addition to teaching science concepts, the models are designed to increase student awareness of issues that have a direct and critical effect on the quality of life and the economy of the state. For example, the Acid Mine Drainage model simulates the effect of the acid discharge from abandoned mines to streams and rivers. As of February 2000, we have completed the development of the DNA model, Wetland model, and Acid Mine Drainage model.

Description of the Models

The models are integrated in to a virtual community called *Highland Park*. Students learn to integrate a number of scientific and mathematical operations as they interact with their computers in a virtual world. *Highland Park*, like much of Appalachia, has undergone considerable environmental damage from past mining and timbering operations and is now being developed into a tourist center and nature preserve. Students enter the park through an interactive image that first explains their work assignments and then provides access to these assignments. Students are directed to assess the effects of past environmental degradation and to develop plans to remedy this environmental degradation by interacting with the computer models.

Some of the models require numeric data collection and manipulation. Such models are integrated with Microsoft® Excel and Word for handling numeric and textual data. In most cases, data files have default names so that the users do not have to worry about which files to access and save. The models are installed on the server, and accounts are assigned to students. Student progress is saved in a database and is accessed by a user name and password. The database allows the students to save their work during a session and continue at a later time. The instructor explains the experiment and the necessary background materials using handouts, online documents, Web pages, and so forth. Students are divided in to groups, members of which are rotated.

DNA Model

The DNA model simulates the process of DNA analysis using the Restriction Fragment Length Polymorphism (RFLP) method. The model uses a crime scene of a badly burned car that was found at the base of a cliff in *Highland Park*. The model starts by presenting a full description of the crime scene and detailed information about the car and the four victims found at the scene. In addition, the model provides necessary information about relatives of the victims.

Students are informed that a murder has been committed and that the crime can be solved only by using DNA analysis on tissue and blood samples gathered at the crime scene and from relatives. The model interactively guides students through the entire DNA analysis process, from preparing blood samples to reading the final results and presenting a final report. Throughout the process, students are asked to make decisions and predictions. Based on their decisions, they may get incorrect results.

Initially students enter the laboratory, where they use interactive lab tools to cut and size DNA. DNA data are entered in to a database. Students take the initial step in solving the crime by querying the database for DNA matches with crime scene evidence. Ultimately, a lab kit, provided by the Integrated Science and Technology Program at Marshall University, provides the final clues necessary to solve the crime.

Wetland Model

The Wetland model simulates the effect of tourism on the wetlands. Using tools built in to the model, students assess the effect of visitors on the various elements of the wetland, including birds, rattlesnakes, salamanders, and a trout fishery. They also assess the effect of waste from condominiums at a nearby ski resort.

Students assess the possible usefulness of a wetland as a tourist attraction by inventorying the bird fauna. Using a binocular tool, students capture images of birds and then record their calls. Images of nests and basic ecological data are also collected. After determining that the wetland contains suitable bird species to attract tourists, students must build a quantitative model that predicts how many tourists can be allowed in to the wetland without negatively affecting the wetland habitat. Students also use the mark-recapture tool to inventory the number of rattlesnakes in an abandoned mine site used as a tourist attraction, salamanders used for food in a turkey habitat, and trout in a trout fishery.

Students are informed that nitrogen-based waste from condominiums at a ski resort may negatively affect a portion of the wetland. They are instructed to build a qualitative model that relates increases in nitrogen concentration to changes in pH, dissolved oxygen, the photosynthetic rate, carbon dioxide, and alkalinity.

Acid Mine Drainage Model

The Acid Mine Drainage model simulates the treatment of acid mine water from an old abandoned mine operation. The model gives students a history of mining in the Blackwater River Valley of West Virginia. Students are presented with an image of the largest treatment facility; maps of the area; and a database that gives pH, dissolved oxygen, alkalinity, carbon dioxide, calcium carbonate, and air and water temperatures for monthly samples gathered during a one-year period. Students go through a series of simulations of lab exercises that demonstrate how pH changes relative to alkalinity. Students interpret their lab data and data from the database relative to standard titration curves. They then use their titration curves and water quality data from the database to interpret overall water quality in the Blackwater River Basin. Finally, students locate the treatment facility on the river by noting where pH and alkalinity increase dramatically. The goal of this model is to direct students to estimate the cost of treating a 4 cubic feet per second (cfs) acid mine discharge for one year. This task requires students to learn basic chemistry skills such as balancing equations and calculating and measuring water quality parameters, including pH, alkalinity, acidity, and hardness.

Acid Rain Model

In the Acid Rain model students try to establish a relationship between acidity in rainfall and whether acid rain is negatively affecting a spruce forest. Students pick five-year-old spruce trees from the forest by drawing a transect line on a scanned photograph of a spruce tree forest. Next they measure the height of the trees from the scanned photographs using a custom tool developed and integrated in to the model. This process is repeated for five sets of data. The acidity of rainfall is simulated by using various concentrations of aerated soft drinks, and measured using pH meters in the wet laboratory. The data are automatically moved in to an Excel environment where students draw graphs and conduct statistical tests to see whether the relationship between growth and acidity is significant. The results are then imported in to MS Word to generate reports.

Experience and Benefits

The primary benefit of the models is that students learn the scientific processes of making their own hypotheses, and proving or disproving them using proper inferences, analysis, and critical-thinking skills. Using current news events helps keep up interest in the scientific process. In addition, some of the tedious and time-consuming steps of the simulated process can be reduced or made more interesting using interactive multimedia. Other benefits are that students learn practical skills using standard tools.

Conclusions and Future Work

The models are currently used in high-school science classes. The current phase of the development includes expansion of each model and integrates the models in to one interactive system, called Wildlife Nature Preserve. The new integrated system includes a set of tools that allows the students to work with wildlife and environmental issues. The tools include a Wildlife Surveying Tool, Visitor Impact Estimating Tool, Environmental Systems Modeling Tool, and Environmental Analysis Tool.

As part of the project, we have conducted training workshops for high-school teachers. Science teachers from selected high schools were invited to participate and receive training and support materials. We also have set a number of scheduled meetings with the teachers and visits to those schools. In addition, we conducted two workshops during the West Virginia Science Teachers Association Annual Conference (Al-Haddad & Little, 1999a, 1999b). We plan to invite more high schools and put the models in more classrooms throughout the state. We presented the concept of these models in national conferences and workshops to science teachers (Little, 1997, 1998; Little & Al-Haddad, 1999), and received favorable comments and recommendations.

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Research Paper: Staying Connected with Professional Development

Information Technology in Teacher Education: A Closer Look

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Introduction: The 1998 IT in Teacher Education Survey

In 1998, the author and others collected information on 416 schools, colleges, and departments of education (SCDEs) in the United States (Moursund & Bielefeldt, 1999). Respondents (mostly deans and education faculty) were asked to rate their institutions in terms of a variety of indicators of capacity, including course work, technology facilities and support, skills of graduates, and field experience opportunities.

A factor analysis of the 32-item survey indicated four groups of items in which the questions were closely related to one another:

- Integration of technology in to the program (7 items)
- Facilities (11 items)
- Field experience (4 items)
- Applications skills (4 items)

Of these, integration (the actual of use of technology in the program) was the best predictor of other aspects of capacity. When questions were clustered in to factors, we observed scattered significant differences on demographic characteristics (e.g., institutions affiliated with the National Council for Accreditation of Teacher Education tended to report more integration of technology), but we could not identify any particular type of institution more likely to report high technology capacity.

Six items, having to do with hours of course work, faculty technology skills, technology planning, and distance education, were not statistically related to any of the factors. The number of hours of technology training integrated in to other course work had a moderate correlation with other ratings of capacity;

however, technology-specific course work had little correlation even with the reported technology skills of graduates.

Our tentative recommendation was that teacher training institutions should concentrate on increasing integration of technology throughout their programs through faculty staff development and field experiences rather than on developing additional technology courses.

High-Capacity Programs

One limitation of large survey studies is that they often do not include information on how the respondents achieved the levels of capacity they reported. In an effort to better ground our findings and to provide guidelines for other institutions, we conducted a follow-up survey of those institutions that had above-average ratings on all four factors in the 1998 survey. In identifying these high-capacity institutions, we first limited our search to those institutions that responded to at least 30 of the 32 survey items, the mean level of response. Then we calculated a total score for each institution on the survey items in each of the four factors. Those scores were compared with the average scores for each factor.

We selected SCDEs that rated themselves highly on all four factors because we believe that aspects of technology capacity are necessarily related. Observers of college classrooms have reported that effective use of technology depends on a combination of facilities, technical support, professional development, and leadership (Barron & Goldman, 1994; Strudler, McKinney, & Jones, 1995). High capacity in one area, such as equipment, may have a limited effect on teaching and learning if it is not complemented with the training and other support needed to make use of the facilities. This relationship was observed in our 1998 survey, in which there were moderate correlations (r=.34 to .62) among the four factors we identified.

Using the previously described procedure, we identified 62 institutions that reported above-average levels of capacity on all four factors. In the spring of 1999, we sent these SCDEs a follow-up survey that asked respondents how they achieved their reported levels of capacity in technology preparation of new teachers. Specifically, we asked each institution to describe what helped or hindered them in providing technology facilities, integration of technology in their programs, field experiences, and graduates with basic technology skills.

In addition, we asked follow-up questions about two findings from the 1998 survey. Noting that the survey did not find a relationship between high numbers of technology course hours and other measures of capacity, we asked each respondent to describe the role of required technology courses in teacher preparation. We also asked respondents to rate (on a scale of 1–4) the importance of several alternative methods of providing technology training, including formal course work within and outside the education program, training integrated in to other education and noneducation course work, prior training in high school or community college, and informal learning.

Another question that we felt required elaboration had to do with technology planning. In 1998, we asked only whether an institution had a written, funded, regularly updated technology plan. Sixty-five percent did not (or the respondents were uncertain whether one existed). Those that did have a plan had somewhat higher scores on the different factors, but the presence of a technology plan explained at most about 5% of the variance. We felt we needed more information on the role of technology planning. We asked the high-capacity institutions (half of whom had plans) to rate, on a scale of 1–4, how important a formal technology plan is to implementing information technology in teacher education, and to describe the characteristics of an effective technology plan. The survey questions appear as an appendix.

Twenty-two of the 62 high-capacity institutions (35%) responded to the 1999 survey. As a group, these SCDEs had mean scores on each of the factors that were .8 to .9 standard deviations above the means for the full sample of 416 institutions (Table 1). As might be expected, standard deviations at this upper end of the sample distribution were considerably compressed.

Table 1. Mean Scores on Factors for SCDEs

Factors	Facilities		Integration		Applications		Field Experience	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
416 SCDEs 1998	30.7	7.9	17.3	6.0	15.9	3.3	9.5	3.6
22 Respondents 1999	38.2	3.9	22.7	3.8	18.5	1.7	12.7	2.3

Note that the questions under each of the factors should be treated as independent scales. There are different numbers of questions and different numbers of possible points under each of the factors. We do not consider the total score on the 1998 survey to be a reliable measure of capacity because the meaning of high or low scores on some items depends on interpretation. For instance, some institutions felt that a low score on required technology courses was a strength because it meant technology was integrated throughout the programs.

Respondents came from five of the six Regional Educational Technology Consortia areas. Overall mean ratings for schools in different regions were similar. The proportion of public and private institutions (55% vs. 45%) was the same in both samples. Compared with the full sample, the high-rating SCDE respondents had a somewhat higher median number of graduates in 1998 (136 vs. 120) and a higher percentage of NCATE affiliation (86% vs. 62%).

Procedure

The author and a research assistant coded each open-ended response from each respondent on the 1999 survey. Types of responses were not specified in advance; each reader was free to propose categories of responses and to sort respondents' comments in to those categories. Units of response could be sentences, phrases, or (in the case of respondents who tended to write in lists) individual words. On most questions, the two readers proposed similar meanings for 60–80% of the response units on the first reading. Combining or subdividing categories so that both readers used the same list of categories brought the agreement to 80% or more.

Results

The types of responses for each item were tallied to identify common themes. Tables 2–9, 11, and 13 show the numbers and percentages of respondents providing each type of answer to each question. (Note that the percentage of respondents for each answer is independent of percentages for other answers; the column totals are not meaningful.) The discussion following each table includes excerpts from the narrative responses. Tables 10 and 12 show the ratings respondents gave for the usefulness of various sources of technology training and for technology plans.

Technology Facilities: Helped and Hindered

Table 2. Elements Reported to Support Provision of Technology Facilities (22 Respondents)

Responses	# Responses	% Respondents
Interest, leadership, commitment	18	82%
Financial resources	16	73%
Infrastructure and technical support	7	32%
Building renovations and upgrades	5	23%
Integration of technology in curriculum	3	14%
Influence of or integration with K-12 technology programs	3	14%
Long-range planning	3	14%
Training, professional development	2	9%
Integration of technology with other departments; sharing	2	9%
Accreditation standards	1	5%

Table 3. Elements Reported to Hinder Provision of Technology Facilities (20 Respondents)

Responses	# Responses	% Respondents
Lack of financial resources or budget allocations	11	55%
Size or age of facilities	5	25%
Personnel: lack of technically experienced faculty	4	20%
Lack of commitment to technology	2	10%
Lack of time	2	10%
Lack of planning or poor planning	2	10%
Lack of technology in K-12 schools	1	5%
"Mainframe mentality"	1	5%

Two factors stood out in helping institutions provide students and staff with adequate facilities: Commitment (mentioned by 82% of respondents) and money (mentioned by 73%). Finances were also the most commonly cited hindrance (55%) to providing facilities.

Another element—organizational infrastructure and technical support—was included as part of facilities on the original 1998 survey. However, seven respondents felt support was important enough to mention on its own.

Various elements were reported by different institutions as helping to drive technology improvements. The most important of these was building renovations, which provided opportunities to rewire and upgrade classrooms. By the same token, facilities that were difficult to upgrade (either because they were too old or being built too quickly) were cited by one quarter of respondents as an important hindrance.

Other "drivers" included long-range planning, the pressure of NCATE accreditation requirements, and the general integration of technology in the program.

Integration: Helped and Hindered

Table 4. Elements Reported to Help Faculty and Students Integrate Technology in to Classroom Practice (22 Respondents)

Responses	# Responses	% Respondents
Training, professional development	15	68%
Technology infrastructure	11	50%
Expectations of teachers, administrators, NCATE	9	41%
Personnel: faculty initiative and skill	8	36%
Incentives for faculty	5	23%
Technology skills of incoming students	2	9%
Student course work	2	9%
Support from K-12 schools	1	5%

Table 5. Elements Reported to Hinder Faculty and Students from Integrating Technology in to Classroom Practice (21 Respondents)

Responses	# Responses	% Respondents
Lack of infrastructure	11	52%
Lack of time	6	29%
Lack of enthusiasm or buy-in	4	19%
Lack of mentors or examples in practice	3	14%
Lack of K-12 technology capacity	3	14%
Other competing requirements of the program or institution	3	14%
Lack of financial resources	2	10%
Lack of training or professional development	2	10%
No hindrances	1	5%

The most helpful technique for promoting integration of technology in teacher education was reported to be professional development for college faculty (mentioned by 68% of respondents). Related to the first point, faculty initiative and skill in using technology were also described as being important to integration (36%).

Lack of professional development was mentioned by only two institutions. A greater concern for most respondents was technology infrastructure and facilities. About half the respondents felt that their facilities limited their ability to integrate technology; the other half felt their facilities were a strength.

Forces helping to drive integration efforts included expectations of teachers (for technology use by students), administrators (for technology use by teachers), and NCATE (for technology use by programs). The growing use of technology in K-12 schools also provides more opportunities to apply integration skills (see Field Experience in the following section), as well as an increasingly computer-adept student body coming out of high school.

Field Experience: Helped and Hindered

Table 6. Elements Reported to Help Institutions Provide Technology-Related Field Experiences (22 Respondents)

Responses	# Responses	% Respondents
Integration of technology field experience in the college program	7	35%
A high level of K–12 facilities and support	6	30%
Effective mentors (college supervisors and K–12 teachers)	6	30%
Funding (grants and bond measures) for facilities and training	6	30%
Dedication and willingness to learn; initiative	5	25%
Professional development at K–12 and college levels	5	25%
NCATE standards	1	5%

Table 7. Elements Reported to Hinder Institutions from Providing Technology-Related Field Experiences (18 Respondents)

Responses	# Responses	% Respondents
Lack of K–12 teachers using technology, whether or not it is present	11	61%
Lack of technology in K–12 schools	8	44%
Lack of time, lab access, or other resources in the college	4	22%
Lack of coordination by the college or university	2	11%
Lack of initiative by students	1	6%

The conditions reported to support technology-related field experience were diverse, with similar numbers of respondents (five to seven) mentioning integration with the college course work, levels of technology in K–12 schools, availability of mentor teachers and supervisors, initiative on the part of students, and training for K–12 teachers and college faculty. There was much greater agreement on the main limitation on field experience programs: the lack of capacity in K–12 schools. That includes both lack of hardware and a lack of teachers using technology (whether or not it is present).

Other hindrances included lack of technology facilities at the college, failure by the college to coordinate field experience opportunities, or failure by individual student teachers to take advantage of technology in the schools.

Applications Skills: Helped and Hindered

Table 8. Elements Reported to Help Students Achieve Proficiency with Word Processing, E-Mail, World Wide Web, and Electronic Gradebooks (22 Respondents)

Responses	# Responses	% Respondents
Technology-specific course requirements	17	77%
Integration of technology in the program; expectations of proficiency	11	50%
Technology infrastructure	4	18%
Ongoing training and support (formal and informal)	3	14%
Strong student background in technology	1	5%

Table 9. Elements Reported to Hinder Students from Achieving Proficiency with Word Processing, E-Mail, World Wide Web, and Electronic Gradebooks (20 Respondents)

Responses	# Responses	% Respondents
Lack of infrastructure	9	45%
Few or no hindrances	7	35%
Not enough course work, or courses offered too late in the program	4	20%
Lack of interest of skill in technology integration on the part of faculty	4	20%
Lack of time for training and program development	2	10%
Large and diverse classes for students	1	5%

Most respondents agreed on what helped their students master basic computer skills: the technology training courses provided in their programs. The other main influence on student technology skills was the overall use of technology in the program: the expectations of faculty and the access and support provided by the institution.

For a third of the respondents, there *were* no serious obstacles to students developing applications skills. The SCDEs that did report hindrances listed lack of infrastructure as the leading problem, followed by lack of technology course work, lack of time to develop courses, and lack of faculty who could integrate technology in to other courses.

Sources of Training

When we asked respondents to rate various sources of technology training for preservice teachers, results tended to mirror responses to the previously mentioned applications skills item. Technology courses within the teacher training program were rated as essential by most respondents, followed by training integrated in to other education course work and informal individual learning. High-school experience and training from outside the program were not considered essential by most respondents (Table 10).

Table 10. Importance of Sources of Technology Training

Source of Training	# Respondents	Unimportant=1	Useful =2	Important =3	Essential =4	Mean rating*
Technology courses within the education program	22	0	1	5	16	3.7
Technology integrated in to other education course work	22	0	3	7	12	3.4
Informal learning from peers or self-study	17	0	4	4	9	3.3
Prior training in high school or community college	21	0	9	9	3	2.7
Technology integrated in to other noneducation course work	22	1	9	9	3	2.6
Technology courses from outside the program	22	5	10	6	1	2.1
* Σ(rating x no. responses) / no. respondents						

Role of Technology Course Work

Our respondents emphasized two points about the role of technology-specific course work: First, the courses build confidence and skills; second, they need to be followed up with actual use of technology in other course work. Eight of the respondents reported that the formal courses were basically a transition to the integration of technology; they may even be phased out over time. Also mentioned were the ideas that integration should be specifically taught as well as modeled, and that technology training was "preparation for the future," not necessarily for immediate integration (Table 11).

Table 11. Roles of Required Computer Courses in Training New Teachers (22 Respondents)

Responses	# Responses	% Respondents
A starting point to build confidence and basic skills	12	60%
Should be followed by integration in to other course work	11	55%
Should be minimized or eliminated in favor of integration	8	40%
A resource; provide support and tools for other course work	4	20%
Should specifically teach integration	3	15%
Necessary for preparing students for the future	3	15%

Technology Planning

The perceived value of technology planning apparently exceeds the actual practice of planning. Only half of the high-scoring respondents reported having technology plans, but all but one rated technology plans to be "Essential" or "Important" (Table 12).

Table 12. Importance of a Formal Technology Plan (22 Respondents)

Not needed=1	Useful=2	Important=3	Essential=4	Mean rating*
0	1	5	16	3.7
* Σ(rating x no. responses) / no. respondents				

All respondents—whether they had a plan or not—had ideas about what a useful technology plan should look like. At least half of the respondents said a plan should have specific goals and objectives; attend to integration of technology (not just provide hardware and software, although that is important); involve all important stakeholders; and be based on needs assessment and ongoing evaluation. Another feature mentioned was professional development. A variety of factors having to do with the practicalities of making a plan work were mentioned by several respondents. These included funding, incentives, and an implementation scheme (Table 13).

Table 13. Characteristics of a Useful Technology Plan (22 Respondents)

Responses	# Responses	% Respondents
Includes specific goals and objectives	13	65%
Includes integration with curriculum	11	55%
Involves all stakeholders	10	50%
Provides adequate facilities and support	10	50%
Provides for needs assessment, evaluation, and revision	10	50%
Provides for professional development	7	35%
Provides for adequate funding	5	25%
Is realistic	2	10%
Provides for actual implementation of the plan	2	10%
Includes incentives for following the plan	1	5%

Discussion

The responses to the 1999 survey tend to support our theory that infusing technology in to teacher preparation requires a comprehensive approach that attempts to balance facilities, faculty professional development, course work, and field experience. Responses in each area often referred to other aspects of capacity. For instance, integration was said to depend partly on having adequate technology facilities. Facilities in turn depend on a level of integration that creates demand. Student application skills are said to be related to both integration and facilities, but integration can itself be hindered by a lack of student computer skills.

Outside of the factors themselves, some helping/hindering agents were mentioned under several categories. Money, of course, was a common need, mentioned in all areas except student skill with applications. Professional development was mentioned under all four factors. We did not ask about how to do professional development, but others have identified time as a barrier to faculty learning new technology skills and integrating them in to instruction (Strudler, et al., 1995, p. 19). In the present survey, time was mentioned (although not specifically tied to professional development) under all factors except student applications skills.

In 1998, we noted that, while many institutions were proud of their technology course offerings, there was little correlation between the courses and the reported levels of integration, student skills, or other factors. In 1999, the high-rating respondents held technology courses in high esteem as a way to build student skills, although they were rarely mentioned as contributing directly to integration or field experience.

When we looked at the original 1998 surveys for these respondents only, we found that a higher correlation did exist between required technology course work and three of the other factors (Table 14). It is interesting to note that student computer skills—which were linked to technology courses in the 1999 narrative responses—composed the one factor that did not correlate well with course work on the 1998 survey.

Table 14. Correlations Among Main Factors and Course Work, 1998 and 1999 Surveys

	Facilities		Integration		Applications		Field Experience		Technology Courses		Integrated Tech Training	
	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999
Facilities	1.0	1.0										
Integration	.41	.39	1.0	1.0								
Applications	44	28	62	.59	1.0	1.0						
Field Experience	.35	.53	.52	.38	.34	.27	1.0	1.0				
Technology Courses	.16	.35	.17	.24	.11	.52	.16	.28	1.0	1.0		
Integrated Tech Training	.18	.43	.33	.35	.19	.05	.23	.49	.20	.15	1.0	1.0

It would seem that the role of technology course work is not primarily to boost student skills in word processing and other applications. As we noted in 1998, students gain technology skills from a variety of sources. Rather, the course work in these high-rating SCDEs probably is most valuable in supporting the integration of technology in the rest of the activities. Presumably, in these high-capacity SCDEs, there is more technology to teach, and more opportunity to apply what is taught.

The 22 high-rating respondents were no more likely than the rest of the original sample to have large numbers of course hours. (Three to four quarter hours was the median number of credits for both samples in both technology-specific course requirements and technology training integrated in to other course work.) However, the course hours seemed to be more related to the rest of the program.

Money, time, and course hours can all be quantified, budgeted, and scheduled. One of the important drivers of technology use mentioned by our respondents is harder to pin down—commitment. Our survey did not ask how SCDEs fostered commitment to technology innovations, but some of the respondents provided clues. One noted that commitment took the form of appointing a vice president of technology. Another reported the administration began requiring technology be included in faculty evaluation plans. In contrast to these top-down commitments, two sites reported that students voluntarily raised their own fees to support technology. Another respondent recounted how he and his colleagues made a presentation before their trustees to gain support for technology. The common thread in these comments seems to be the role of human initiative, facilitated by administrative actions and access to information. It suggests that supporting the innovation actually means supporting the innovators.

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Appendix:

Information Technology in Teacher Education
1999 Capacity Questions

1. We're interested in knowing more about how you achieved the high levels of capacity you reported in 1998. Please tell us what you consider to be the key elements that ....

    1.1.1 Helped your institution provide technology facilities for students and teachers.
    1.1.2 Hindered your institution in providing technology facilities.
    1.2.1 Helped faculty and students integrate technology into classroom practice.
    1.2.2 Hindered faculty and students from integrating technology into classroom practice.
    1.3.1 Helped your students achieve proficiency with word processing, e-mail, the World Wide Web, and electronic gradebooks.
    1.3.2 Hindered your students in achieving proficiency with word processing, e-mail, the World Wide Web, and electronic gradebooks.
    1.4.1 Helped your institution provide technology-related field experiences for students.
    1.4.2 Hindered your institution in providing technology-related field experiences.

2. In our 1998 survey, higher numbers of IT-specific course requirements did not correlate with higher reported capacity in other areas. In your opinion, what is the role of required computer courses in training new teachers?

3. Postsecondary students acquire their technology skills from a variety of sources. Please rate these sources of technology training as to how important each is for students in your program. Use the following scale:

1=Unimportant; rarely used	2=Moderately useful; used by some students	3=Important; used by many students	4=Essential; used by most students

Source of training	1	2	3	4
Technology courses within the education program.				
Technology courses from outside the education program.				
Technology training integrated into other education coursework.				
Technology training integrated into other non-education coursework.				
Prior training in high school or community college.				
Informal learning from peers or self-study.				
Other (describe):				

4.1 In your opinion, how essential is a formal technology plan to implementing information technology in teacher education?

__1: Not needed	__2: Not essential, but useful	__3: Very important	__4: Essential

4.2 In your opinion, what are the key characteristics of a useful technology plan?

Research Paper: Connecting Technology to Teaching and Learning

Active Learning Strategies in Computer Graphics

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Key Words: **active learning, aesthetics, OpenGL®, ray tracing**

Abstract

In this paper, active learning models are applied to computer graphics. Lectures are augmented in real time with student activities, inquiry-based reasoning, and other methods of initiating student contribution to the learning experience. This approach promotes a more comprehensive, deeper, and more memorable understanding of the theory, principles, and methodologies of computer graphics. A progression of such activities is presented as they are applied in the course.

Introduction

The classical model of lecture-homework-exam does not meet the challenge of contemporary students. When competing with mass media and other forms of information delivery, a verbal lecture does not leave enough sensory impression. Likewise, even what students read in a passive framework is barely remembered, less so in pre-examination cramming. Weaker students have difficulties in reading, most notably with abstract and mathematical concepts. These problems are magnified in computer graphics, where mathematical expressions/structures and programming projects may prove too formidable.

The solution to these problems requires a radically different approach to lectures, homework, and projects. Lectures should involve periodic breaks in which students perform activities that reinforce the concepts being inculcated. The activities should be simple at first and based upon student experience or a familiar context. In the beginning, this may mean giving the students programs with which to experiment rather than expecting that they write the code.

Foundations and Aesthetics

At the earliest stages, students need to understand the concepts of color and resolution, especially appreciating their effect on the images generated. To achieve that, a useful exercise is to have students download sample GIF or JPEG images and view them in a standard imaging package such as Photoshop® or LView®. There are many such packages in the public domain. Next, have the students magnify the images to see the inherent pixel nature of the image. Another useful exercise is to have them view the photograph at 4, 16, 256, ~65,000, and 16 million colors. They quickly recognize the associated information content. Have them save the files at each step. They directly see the "space complexity" measure by looking at the file sizes. To demonstrate the effects of compression, have students save an image as a bitmap (such as uncompressed TIFF).

These activities also prove useful when preceding a lecture on the hardware and history of computer graphics. Most students have little idea that the era of mainframe and minicomputer dominance involved little graphics beyond character-mode printed posters. Some may remember low-resolution four-color applications of the early 1980s. To best contrast this evolution, have them compare small, simple overview-perspective games with textured-bitmapped first-person three-dimensional games. Restrict this time period to at most five minutes, the goal being discernment, not frivolity. This can be followed by a discussion of the historical trends of graphics hardware during the 1980s and 1990s. The need for increasing memory model size, graphics memory, display resolution, CPU speed, and for coprocessors takes on a greater reality. The importance of the transition from two dimensions to three becomes apparent. Another useful exercise in hardware appreciation is to run several graphical programs (from the student assignments) with specialized graphic-instructional primitives utilizing the coprocessor, and then run those programs without them. A graphical simulation of raster scan operations would be useful but none are available.

To facilitate this initial experience-orientation, a textbook should introduce colorful samples of computer graphics early. Hearn and Baker (1997; the primary text used in this course) and Firebaugh (1993) provide numerous illustrations at this stage.

Graphic Primitive Programming

Programming in computer graphics often begins with designing a line-draw function from a single-pixel dot function. One useful exercise is to hand out graph paper and have students "x"-out boxes to draw lines. They easily accomplish this for drawing y=x and y=0. At y=(3/7)*x and y=(1/4)*x, serious problems become evident. At this point, they are ready to code a simple incremental algorithm (such as digital differential analyzer—DDA). After several runs, have students try their algorithm with y=100*x. Students arrive on their own at the conclusion to switch the looping dimension depending on slope.

Bresenham's line algorithm requires even more preparation. One activity students enjoy is calculating. Using a spreadsheet package, have students compute intermediate numerical values that Bresenham requires and then use the chart facility to view the results. After this prototyping activity, students are generally more confident in proceeding to the program design stage.

Another useful exercise is for students to form teams, each responsible for a distinct algorithm for solving the same problem. In the circle-generating problem, each team has a different algorithm to program and they post their timing results on the board. This is also a good time to compare their results with those produced by a coprocessor's routine.

Two-Dimensional Programming

The next exercise is to design a plotting routine for an arbitrary parametric curve in the plane (see Figures 1 and 2 for examples of parametric curves). A good first step is to have students research on the Web or in the library about particular parametric curves, such as hypotrochoids. After studying the curves and getting formulas for them, students insert those formulas in the plotter routine. This routine (only 25–30 lines of code) generates 1,000 points of that curve, computes the maximum and minimum values, and then scales and plots all points based on those maximum and minimum values.

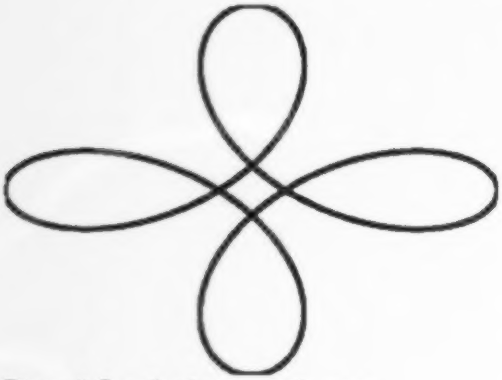

Figure 1. Standard parametric curve.

A bountiful source of several major families of parametric curves is Lawrence (1972). Introducing parametrics is important because of the decline in their coverage in a significant portion of modern calculus texts, despite their central role in several areas of computer graphics. They serve as a useful introduction to multivalued functions, broaden student understanding of piecewise linear graphics in the plane, and have applications in simulation.

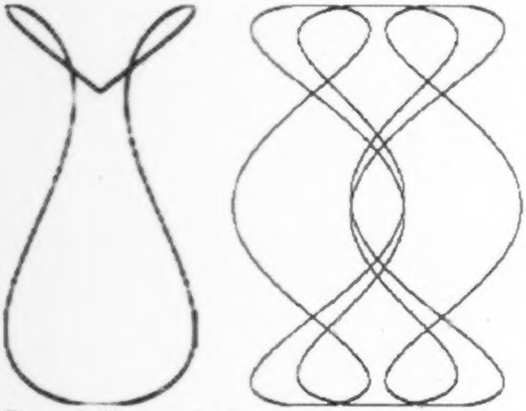

Figure 2. Nonstandard parametric curves.

The team approach works well with fill algorithms. In each team, one person supervises the trial drawings and the key logic therein. The second person converts the samples and reasoning into a program. A third person constructs test inputs; these inputs should adequately address problem situations and thoroughly test the code. Finally, the fourth person is responsible for debugging and testing. The debug phase often produces surprising results, the most amusing being fills that go beyond boundaries and inundate the screen.

Anti-aliasing models can be tested by editing an enlarged image and then reducing it to see the actual results at the normal scale. This is best accomplished with line segments since this activity requires some effort even for small segments; that segment can then be duplicated and concatenated to see the final results.

Transformations are easily experimented with; most image-processing packages have such options. At the stage of students programming transformations, the situation has some interesting side effects. When working with line segments defined by endpoints, the matrix transformations work well. However, when students run their transformation procedures on images, the side effects from rotations and scaling are quite shocking. The need for interpolation becomes acute.

Clipping algorithms can be covered by first providing some examples for the whole class to solve by hand on paper, providing the solutions when errors are encountered, and then forming teams for the actual programming. The problem in programming is that students often "visualize" the solution before applying the algorithms in the class problem-solving efforts. During the programming, no such global intuitions are available during execution. Teams of at least four are needed here; at least one student should concentrate just on the algorithm's steps, not the coding issues, to guarantee adherence to the method assigned. Roles of students in each team should be based on their decisions; to impose a rotation of functions on students often irritates them by blocking their opportunity to contribute in areas of their strengths.

Three-Dimensional Wiring

The introduction to three dimensions requires an extensive review of vector and matrix operations. Intermix lecturing with student calculation exercises (see Figure 3).

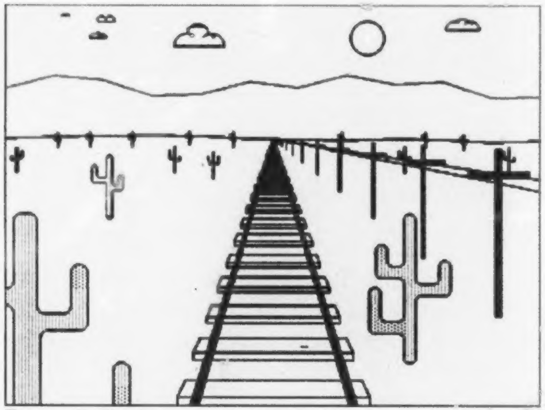

Figure 3. Early exercise in wire-frame, three-dimensional perspective calculation, depth cues, and random-image generation (desert scene).

It is beneficial to have students verify their results on a simple wire-frame modeling program. As they progress from the basics to the three-dimensional transformations, this visual verification becomes indispensable. Students should program short routines to read/construct and display polygon tables and quadrilateral meshes. They can then modify their two-dimensional transformation procedures to three dimensions (a short activity). At this point, have the students modify their 1,000-point plotter in two dimensions to three dimensions and apply transformations to give perspective. The resultant surface plotter is quite an accomplishment.

Students consistently dread the spline representation. Having students generate sample cubics with their two-dimensional plotter routine helps them understand the versatility of this curve. A formal discussion of curvature and quadratic limitations will give some background but rarely convinces them as well. A computer-aided design (CAD) or drawing package with splines built-in is an effective way for students to visualize the effects of control points. After several proofs and many numerical examples, assign a different spline algorithm to each team. After computing coefficients, have students test their results by running the plotter routine on the spline and also plotting the data points.

Solid Phase: Ray Tracing

Introducing a public domain ray tracer such as a Persistence of Vision™ Ray Tracer (POV-Ray) is an effective way to approach constructive solid geometry (see Figure 4). Students find the programming less pressured, can concentrate on concepts, and produce results too time-consuming to completely program otherwise. This approach was presented in Owen, Larrondo-Petrie, and Laxer (1994) and Schweitzer (1990). POV-Ray includes online interactive tutorials. POV-Ray code samples on the Web are abundant. Students develop a solid appreciation of three-dimensional positioning, perspective, lighting, color, and texture as they construct several scenes. Several books by Waite Group Press are complete introductions to ray tracing and animation with POV-Ray, most notably Young and Wells (1994) and Bowermaster (1994). Unfortunately, all of them are out of print but are worth borrowing through interlibrary loan with their CDs. The C/C++ code can interact with the user and then call POV-Ray routines to accomplish the task. One popular activity is to write recursive C code for a Lindenmayer system. This generates point and arc information, which is then rendered using POV-Ray. This may be a student's best opportunity to see the inherent power of recursion.

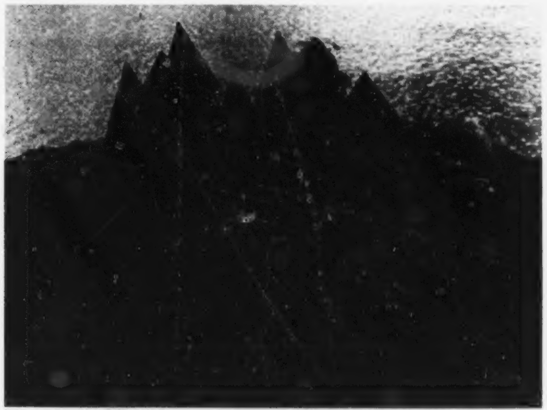

Figure 4. POV-Ray generated scene.

Ray tracing prepares students for actual C/C++ programming with depth, shadows, reflections, and other three-dimensional characteristics. Pedagogical exercises with folded paper models can serve as a prelude to algorithm design for binary space-partitioning (BSP) trees and hidden line removal. Bringing a flashlight and metal objects to class will illuminate during a lecture on normals, lighting, and reflection. By turning off the overhead lights and closing the shades, students can get a more dramatic and realistic view than any ray tracer could produce. This serves as an effective lab exercise. The mathematical model and subsequent C/C++ code follows.

One of the benefits of using C/C++ is that scene generation occurs in real time, so that if a bug occurs, students can predict and observe when the scene went bad. It is also more amusing watching objects and shadows get generated.

Fractals and Randomized Models

The simplest exercise in randomization (Monte Carlo methods) in computer graphics is to have students write a C/C++ program to generate a wire-frame grid and then use a random-number generator to raise or depress grid-points on that surface a random but carefully bounded amount (like wrinkling). This is an easy and short program, described in Pokorny (1994). Going a step further, have students use nonuniform random-number generators to produce different textures. As a final step, apply color variations depending on surface height. Applying colors carefully, one can achieve the effect of geological strata.

Another application of random numbers and colors is in producing cloud formations (see Figure 5). Using a random-number generator with a Gaussian distribution and applying shades of white on a blue background in cluster patterns, students can produce impressive results.

As an independent but not mutually exclusive methodology, fractals and space-filling curve generation also gives students an occasion to write functions in class that generate complex natural objects and scenes (see Figure 6). By putting more parameters in to this function (such as angles and length ratios), broad categories of fractals can be generated.

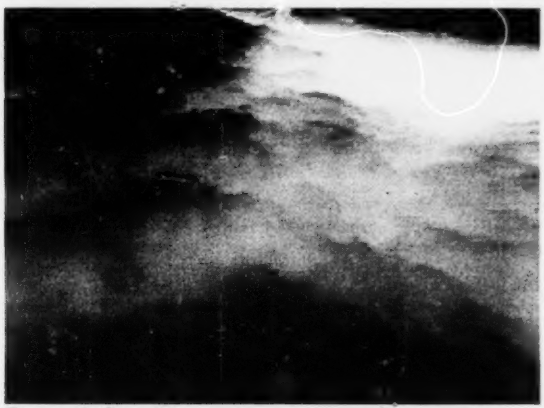

Figure 5. Cloud formation using random-number generators (compare with Figure 6).

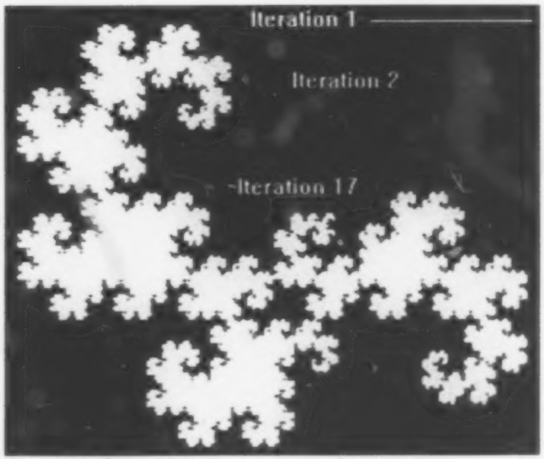

Figure 6. Space-filling recursive functions.

As an exercise prior to coding, students can download sample fractal programs, some quite professional, such as Fractint, from the Web and generate fractals with which to compare their own results. Hand drawing Koch curves also serves to motivate students.

Animation

The greatest obstacle to animation is student anticipation of greater effort being required. The idea of physical trajectories and producing frames/time-parametrized functions induces anxiety. To alleviate it, start with a programming exercise to draw a short horizontal line segment and then to erase the segment. Add a loop to the code to draw the segment farther to the right each time. To give an apparent smoothness of motion, have the loop not redraw the line segment but just delete one pixel on the left and add one on the right. This incremental approach "slides" the image.

The second animation exercise would be to write a function to draw a small car or, if students have learned file formats already, redraw a small scanned bitmap of a car. Combine this code with the previous nonincremental animation.

Another source of simple animations to demonstrate is the Web with its numerous animated GIF files. A frame-by-frame display of these can be accomplished by using any of several GIF-animation utilities (also on the Web). Students should be cautioned that these are often hand-drawn and are more akin to the mechanical cartoon arcades of the previous century or flip books than to computer graphics.

For nonlinear motion, a simplified solar system is an excellent programming exercise. One option is the practice in shading the planets as they move. Another optional modification is to add random periodic bumps on the surface and shaded boundaries to give the appearance of rotation and bumpiness.

At this stage, students are ready for the final project in animation. To encourage originality and imagination, several inspiring animations are demonstrated from the CDs of Bowermaster (1994) and Shatz (1993). SIGGRAPH also publishes CDs with exceptional animations but those are of higher caliber and often involve hardware and software that are not available to students.

Other Resources and Issues

Books by Clifford A. Pickover (1990, 1991) provide very readable and well-illustrated expositions on topics including computer graphics. Unlike other popularizations, Pickover's include programming code. The Graphics Gems multivolume book series also provides short expositions that could be converted into exercises or projects.

Implementation support is always a consideration, but more so in computer graphics. Without 24-bit color, these activities would suffer; other less-pressing necessities are a robust combination of memory (more than 32 MB), graphics memory (more than 4 MB), and operating system (such as UNIX, Linux, or NT).

Since students are concerned about applicability of knowledge, we have recently shifted toward OpenGL as a standard. Since NT platforms are the student preference, a second text we require for the course is Wright and Sweet (1996). If NT is not a concern, a single compact text covering both computer graphics principles and OpenGL is Angel (1997). Finally, for those not using OpenGL but using X-Windows, Pavlidis's 1982 classic has been modernized (in 1996) and expanded with exercises concentrating on interactive, event-driven programming.

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Research Paper: Moving Beyond the Crossroads: Teachers as Agents for Change

Goals 2000: Initial Evaluation

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Key Words: **Goals 2000, integrating technology, teacher training**

Introduction

The following is an evaluation of a Goals 2000 project being carried out in a rural western school district. Project participants have embarked on a series of training modules designed to develop their skill with a variety of software applications and the integration of technology within the curriculum. Participants are receiving training and a new laptop computer with Windows® 95 for use in their respective jobs. Participants include administrators and classroom teachers.

An initial study was conducted in the fall to frame a benchmark for evaluating the success of the project in providing the teachers with the technical skills, knowledge, and motivation necessary to integrate technology within the curriculum effectively and efficiently. A follow-up evaluation was conducted the following spring. This is an ongoing project, so evaluations will continue to be conducted on a yearly basis.

Methodology

Six questions formed the focus of this evaluation:

1. What technology related skills do participants in the project already possess?
2. What concerns do participants currently have regarding the integration of technology within the curriculum?
3. How are teachers currently using technology within the classroom?
4. At what Level of Use are participants in their current use of technology and its integration within the curriculum?
5. What technology related skills are students currently acquiring through their teachers' use of technology within the curriculum?

6. What is the perceived impact of current technology use by teachers on students?

Data collected to answer these questions were obtained through the use of interviews with, and questionnaires completed by, participants in the project. Initially, 23 project participants were interviewed and completed the questionnaires: 2 school board members, 4 elementary teachers, 10 secondary teachers, and 7 administrators. In the spring follow-up, 14 participants were interviewed and completed questionnaires: 6 elementary teachers, 7 secondary teachers, and 1 administrator. The group that participated in the initial evaluation was not included in the spring evaluation. We were not prepared at that time to do a comparison group based on training, across the group. The district was well represented in this project with an administrator and at least two teachers from each building being included. Participants included educators who were already well versed in technology and others who had limited experience with technology. Participants ranged from 23 to 57 years in age, with the average age of the participants being 43; 57% of the participants were female and 43% male. Teachers ranged from first-year teachers to those with 31 years of experience.

The Concerns-Based Adoption Model (CBAM), a model developed in the 1970s to assess, facilitate, and evaluate the change process, served as the basis for this study. CBAM provides a strong tool for evaluating implementation efficiently and effectively. The diagnostic components of CBAM are designed to evaluate the change and adoption process, attending not only to the technical problems associated with the adoption of an innovation, but also to the personal perceptions of the potential adopter.

The CBAM model includes three diagnostic dimensions: (1) Stages of Concern (SoC), (2) Levels of Use (LoU), and (3) an Innovation Configuration Map (ICM). The Stages of Concern questionnaire (SoCQ) and Levels of Use interview were used in this evaluation. The Stages of Concern questionnaire was used to assess the intensity of the feelings and perceptions that the participants held in relation to the integration of technology within the curriculum. (Alpha coefficients on the SoC questionnaire range from .64 to .83, and test-retest correlations range from .65 to .86.)[1] The Levels of Use interview was used to assess where participants were in their current use of technology and its integration within the curriculum. (The LoU interview has a 98% correlation with observation.)[2]

After completing the Stages of Concern questionnaire, participants were asked to respond to the open-ended question "What are your concerns about integrating technology into the classroom?" The question was used to clarify the concerns expressed by project participants.

In addition to these diagnostic procedures, participants were asked to complete two additional questionnaires: an impact survey and a self-assessment of their skills with computers and application software. The impact survey contained questions regarding the effect of current technology integration within the curriculum. The statements participants were asked to respond to addressed the quality of student work, learning behaviors, teaching with technology, communication with parents and students, interactive classroom organization, student technology skills, and student interaction. The purpose of the survey was to assess the participants' perceptions of the effect that their current use of technology is having on student learning, the development of technology skills by students, student achievement, and teacher pedagogy.

The self-assessment contained specific questions regarding a variety of technology skills: computer operations, word processing, operating systems, spreadsheets, databases, computer graphics, desktop publishing, telecommunications, and multimedia. The self-assessment was used to assess the participants' current skill with these technology applications.

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[1] Hall, G. E., George, A., & Rutherford, W. (1986). *Measuring stages of concern about the innovation: A manual for the use of the SoC questionnaire.* Austin: The University of Texas at Austin, Research and Development Center for Teacher Education.

[2] Hall, G. E., & Hord, S. M. (1987). *Change in schools: Facilitating the process.* New York: State University of New York Press.

Data Analysis

The data collected from each of these assessments were analyzed using a combination of quantitative and qualitative methods. A comparison of means was used to analyze the scores obtained from the SoC questionnaire. The LoU interviews were scored using a rubric created by the developers of the Concerns-Based Adoption Model.[3] A frequency count was used to analyze the responses to the impact questionnaire. Means calculated within each skill area were used to analyze the self-assessment. The data obtained from individual participants were compiled and comparisons made between their responses. Trends were identified and outliers explored in greater depth.

The information was also grouped according to the participants' roles in the district: administrator, elementary teacher (K–6), and secondary teacher (8–12). The data obtained from school board members were included with those obtained from the administrators, unless otherwise noted. The data obtained from the K–12 music teachers were included with those obtained from the secondary teachers.

Results

What technology related skills do participants in the project already possess?

The participants in this project, as a whole, have very limited technology skills. In the self-assessment questionnaire participants were asked to rate their ability—(1) no-knowledge, (2) limited knowledge, (3) some knowledge, (4) competent, and (5) expert—with the following technology skills: computer operations, word processing, operating systems, spreadsheets, databases, computer graphics, desktop publishing, telecommunications, and multimedia. Most participants rated themselves ranging from some knowledge to competent in response to the question "I know how to properly boot up, operate, and shut down the computer." But, otherwise, skills were limited in most areas (see Figure 1).

Administrators rated their word processing, operating system, telecommunications, and spreadsheet knowledge between limited knowledge and some knowledge. Their strongest skill area (see Table 1), word processing (2.83), was rated as having some knowledge. The administrators rated their skill level closer to no-knowledge in the other skill areas: computer operations, databases, computer graphics, desktop publishing, and multimedia.

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[3] Hall, G. E., & Hord, S. M. (1987). *Change in schools: Facilitating the process.* New York: State University of New York Press.

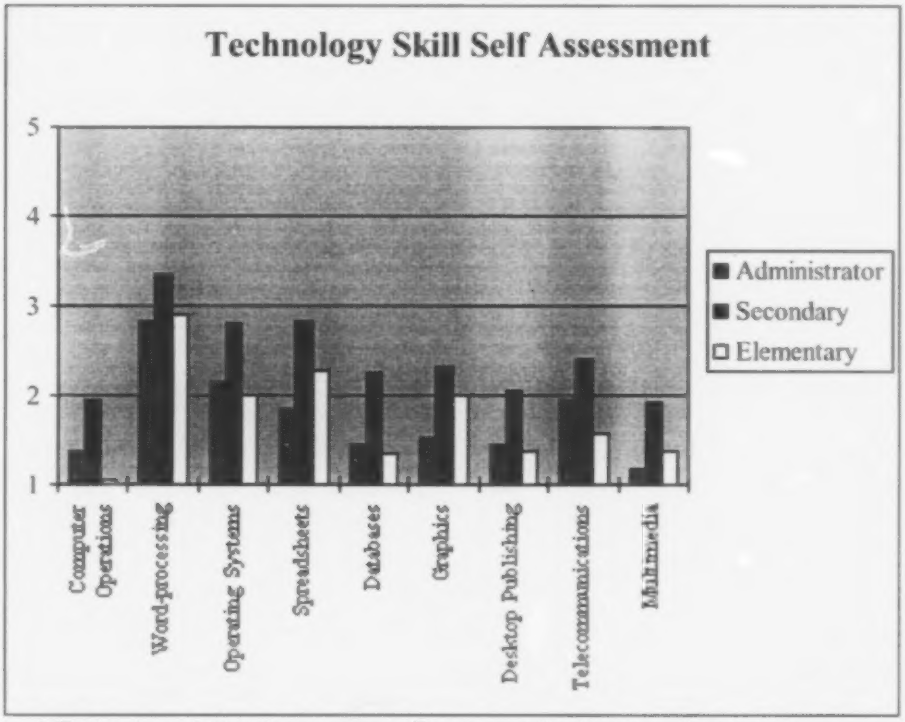

Figure 1. Technology skills self-assessment. Results are displayed by educator role.

Secondary teachers rated their level of ability in all skill areas between limited knowledge and competent. They rated their strongest skill areas (see Figure 1) between some knowledge and competent: word processing (3.34), operating systems (2.81), and spreadsheets (2.82). The secondary teachers rated their skill level closer to limited knowledge in the other skill areas: telecommunications, computer graphics, databases, desktop publishing, computer operations, and multimedia.

The elementary teachers rated their level of ability in spreadsheets, computer graphics, and operating systems between limited knowledge and some knowledge. They rated their word-processing skills as competent (2.89; see Figure 1). The elementary teachers rated their skill level closer to no-knowledge in the other skill areas: telecommunications, multimedia, desktop publishing, databases, and computer operations.

What concerns do participants currently have regarding the integration of technology within the curriculum?

Initially, administrators had high Informational concerns and high Collaboration concerns. The one administrator interviewed during the spring meeting demonstrated lower Informational concerns. Informational concerns focus on a general awareness about integrating technology within the curriculum and an interest in learning more detail about the integration of technology. Collaboration concerns focus on the coordination of activities related to the integration of technology with others. These concerns would seem to be appropriate for administrators. Board members had very much the same concerns.

Table 1. Technology Skills Self-Assessment Mean Ratings

	Administrator	Secondary	Elementary
Computer Operations	1.37	1.95	1.04
Word Processing	2.83	3.34	2.89
Operating Systems	2.14	2.81	2.00
Spreadsheets	1.85	2.82	2.28
Databases	1.46	2.25	1.35
Graphics	1.52	2.33	2.01
Desktop Publishing	1.45	2.05	1.37
Telecommunications	1.96	2.39	1.57
Multimedia	1.18	1.93	1.38

In the initial group, the concerns of the elementary and secondary teachers were more extensive. Elementary teachers had high Informational and Collaboration concerns, but they also had high Personal concerns. High Personal concerns indicate that the individual is uncertain about the demands of integrating technology within the curriculum and the individual's ability to carry out the task. This could include concerns about the reward structure in place for this project, decision-making matters and how they are being carried out, and potential conflicts with other areas of the job. Informational concerns were still high in the spring, indicating that the problems identified, because of lack of information, in the fall had not been addressed. Management concerns were also beginning to peak among the participants, indicating the participants were beginning to be concerned about how they would manage the use of technology within their classrooms. Participants continued to express Collaboration concerns with an additional emphasis on Refocusing concerns. The participants seemed to have ideas for refocusing their efforts on options other than technology that would enhance learning in the classroom. The elevated Collaboration concerns would indicate that the participants continued in their concern with coordinating their efforts with those of other teachers in their buildings. This could be emphasized because the schools included within the study offer specific technology classes during the school day in which classroom teachers are expected to collaborate with a technology teacher.

In the initial study, the secondary teachers, on the other hand, had high Personal concerns, high Collaboration concerns, and high Refocusing concerns. They were concerned that technology have a positive effect and not a negative effect. They were also wondering whether technology really is a solution; are there other means of teaching that would be better than technology? The group interviewed in the spring exhibited these same concerns. The secondary teachers demonstrated elevated concerns across the board.

The process of change can be more successful if the "concerns" of the individual are considered.[4] The concept of concerns, in this instance, includes the participant's feelings, preoccupation, thought, and consideration toward the integration of technology within the curriculum. The participants in this project have strong Personal concerns and strong Impact concerns. They want to know how this will affect how and what they teach. They also want to know the potential effect on student learning. In their view, there cannot be any continuous effect unless there is continued support for this project beyond this initial implementation. Without funding for additional hardware and software, the training the participants will be receiving in these workshops will be of limited usefulness. Additionally, they would like for this opportunity to be afforded to other faculty members, and, in their view, without continued financial support this will not be possible.

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Primary among the participants' concerns is the availability of technology, additional funding, time to implement integration projects, time to learn the necessary skills, and technical support. One participant expressed the concern that "the technology that we currently have is not being used to its fullest capacity."[6] The reason given for this view focuses primarily on training of faculty and staff. Once they have training, the participants are concerned that they will not have the necessary hardware and software to adequately integrate technology within the curriculum. Characteristic of this uncertainty was the following statement: "At this point in time, I feel quite unprepared and untrained to do much integrating for my students. In addition, I don't believe we have adequate equipment to be able to do a first-rate job of integrating technology. So, my question is, will we be able to obtain the equipment needed if we decide to integrate?"[7] In relation to time and technical support, the following quote characterizes the participants' concerns: "Time. I am concerned about trying something new and exciting then experiencing glitches beyond my control which will waste valuable learning time."[8]

How are teachers currently using technology within the classroom?

Currently, there is very limited integration of technology within the curriculum. Most integration is limited to using technology as a resource tool. Among the administrators, technology is primarily used as an administrative tool for preparing memos and administrative reports. One of the administrators, however, actively searches for Internet sites and other resources for the teachers in his building.

The integration of technology within the curriculum by teachers seems to be limited, to a great extent, by the availability of up-to-date technology within their classrooms. Those with only one computer in their room use the computer primarily as a resource tool for preparing for their classes. Several teachers go somewhat further and find Internet sites to enhance their lessons—either at home or on the classroom computer, depending on their access to the Internet.

Those with access to more than one computer utilized a variety of models: word processing by students, drill and practice, and the generation of products by students. Those using the computer for word processing by students were primarily using the computer as a tool for students to type their final products: reports, poems, and stories. Several teachers used the computer as a workbook that would give immediate feedback, providing students with further practice by using drill and practice computer programs. Finally, a couple of teachers designed specific assignments in which the students used computer software and the Internet to do research and eventually develop a product on the computer. Teachers who go to the extent of having students create products on the computer hold the view that by using the computer as a generative learning tool students will develop their higher-order thinking skills. These teachers also had easy access to three or more computers.

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[6] SoCQ 3925
[7] SoCQ 1768
[8] SoCQ 6421

At what Level of Use are participants in their current use of technology and its integration within the curriculum?

The Levels of Use construct provides a key ingredient for understanding and describing the implementation of an innovation. Levels of Use focuses on the behaviors that are or are not taking place in relation to the innovation.[9] Typically a person will move in sequence from Level of Use 0, Non-Use, to Level of Use IVA, Routine, assuming that the innovation is appropriate, the leader and other change facilitators fulfill their roles, and time is provided. The first use of an innovation tends to be disjointed and erratic. Most new users cling to the users guide and concentrate on the day-to-day uses more than considering long-term uses. Hall and Hord[10] indicate that individuals typically remain at the Mechanical level for an extended period of time. As the user becomes quite experienced, they move in to Level of Use IVA, Routine. Once users reach a Routine Level of Use they typically fall in to a comfortable pattern for using the innovation. As users move toward the higher Levels of Use—IVB, Refinement; V, Integration; and VI, Renewal—adaptations are intended to improve the effectiveness and positive outcomes from using the innovation. The focus is now on increasing effects with students.

The participants in this project ranged in their Levels of Use from that of a Non-User, orientation perspective, to that of a teacher who was working to integrate her use with that of other teachers in an effort to increase the effect of the integration of technology on her students.

The administrators were primarily at a Mechanical Level of Use, still working their way through the idea of integrating technology within the curriculum and developing their own skills to the point where they feel comfortable using the technology that is available to them. One administrator was at LoU IVA, Routine. The administrator was comfortable with his current use of technology and was not, at that time, looking to change how he was using the computer. His use of technology centered on administrative word-processing and using the Internet as a means for accessing the news. Another administrator was at LoU IVB, Refinement. This administrator spent a good share of time looking for resources, software, and Internet sites that would help teachers in his building increase the effect of technology on student learning.

The school board members who participated in this study were dichotomous in their use of technology. One board member was active in the use of technology as an administrative tool for business purposes. The other board member was a Non-User, preparing to learn how to use technology.

The secondary teachers ranged from a Non-User to teachers who had already reached a Routine Level of Use or who were refining their current use so that they could have a greater effect on their students. One of the secondary teachers actively uses the three computers available to her to teach the content to her students. She utilizes the Internet for student research, runs tutorial programs to help her students further develop their skills, and develops projects for the students to complete on the computers. Another teacher uses the nine computers available to him as a supporting piece for one of the units he teaches. When students use the computers it is primarily for the purpose of drill and practice or to complete spreadsheet exercises outlined in the text. Access to the computers is limited to keep students from playing games on the computers.

The elementary teachers ranged from a Non-User to one who was working with other teachers, collaboratively, in order to have a greater effect on her students. One of the elementary teachers used AlphaSmart®, to which her students have access, for students to type the final draft of their writing. The writing is then uploaded to the computer and printed out. This particular teacher is striving to learn all she can to increase the effect of technology on her students, including working with other teachers to enhance the learning process. She is at an Integration Level of Use (V). But other elementary teachers were at a Mechanical Level of Use (III).

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[9] Hall, G. E., & Hord, S. M. (1987). *Change in schools: Facilitating the process.* New York: State University of New York Press.
[10] Hall, G. E., & Hord, S. M. (1987). *Change in schools: Facilitating the process.* New York: State University of New York Press.

What technology related skills are students currently acquiring through their teachers' use of technology within the curriculum?

A majority of the participants said that students were learning how to use computer application programs because the teacher was integrating technology within the curriculum. When questions regarding the use of application programs were framed in the statement "Because of my use of technology in the classroom," 74% (71% spring) of the participants said that students could use a word-processing program and 70% (93% spring) said that students could print their own documents. Only 52% (50% spring) of the participants said that students could use a database. Fifty-seven percent of the participants said their students could use HyperStudio® in the spring, compared with only 43% in the fall. The use of other application programs was not perceived to be as strong (see Table 2).

Table 2. Percentage of Participants' Perception of Student Technology Skills

Application Program	Fall	Spring
	Students Can Use	
Word Processing	74%	71%
Print Documents	70%	93%
Databases	52%	50%
HyperStudio	43%	57%
Spreadsheets	39%	43%
PowerPoint®	17%	7%

What is the perceived impact of current technology use by teachers on students?

Participants were asked to respond to a variety of impacts that have been identified as being a result of integrating technology within the curriculum. The initial group of participants in this project did not strongly agree or agree with very many of the 76 phrases presented to them. Those interviewed in the spring maintained a more positive attitude. This may be the result of a year's worth of work or a difference in attitude promoted by the training provided. These phrases represented impacts on the quality of student work, learning behaviors, interactive classroom organization, teaching with technology, student interaction, and communication. Table 3 details those phrases in which more than 50% of the participants strongly agreed or agreed with the statement. Each area covered by the impact survey is represented in Table 3. Participants agreed with other statements included in the survey but not to the level identified in the table.

Table 3. Responses to Phrases Concerning the Use of Technology in the Classroom

Because of my use of technology in the classroom:	Fall	Spring
	Strongly Agree/Agree	
Quality of Student Work		
Students take more interest in learning.	48%	79%
Students stay focused on learning for longer periods of time.	39%	71%
Students demonstrate more independent learning.	70%	64%
Students use technology to support higher levels of learning.	48%	79%
Students are learning the content in greater breadth.	30%	79%
Students express interest in topics being studied.	52%	71%
Learning Behaviors		
Student work demonstrates more creativity.	48%	86%
The complexity of students' work has increased.	43%	71%
Students express original thoughts related to classroom topics.	35%	71%
Students are adding relevant information to the classroom discussion.	39%	71%
Interactive Classroom Organization		
I plan more hands-on and cooperative learning activity.	52%	43%
Technology has allowed me to increase the degree of student involvement.	52%	64%
Teaching with Technology		
I have learned to use a new technology teaching tool.	52%	64%
The computer has become a learning tool in my classroom.	52%	71%
I have found that my enthusiasm for teaching has increased.	43%	71%
I am able to make content more relevant to students (real world).	65%	64%
I have greater access to outside resources.	70%	71%
I now allot more class time to hands-on learning activities.	48%	64%
I use the computer as a learning center in my classroom.	52%	57%
Technology has increased the reliability-validity of information available for me to use in instruction.	57%	57%
Student Interaction		
Students are encouraged to participate in peer tutoring.	48%	79%
I use my students as a resource for working with the computer.	65%	64%
Communication		
I communicate personally with other teachers at my school more.	52%	36%

Summary

The participants in this project have limited technology skills, and the integration of technology within the curriculum is not happening, except on a very limited basis. The majority of the integration techniques that are being used have the possibility of a very limited effect on student learning and on how students are being taught. Hence, the participants have a very limited view as to the effect that technology is having on their teaching and their students. Only a few teachers are currently striving to make technology an integral part of student learning by having students use the computer as a generative learning tool, creating real-world products and participating in real-world simulations.

The administrators participating in the project have limited technology skills and are only at a Mechanical Level of Use with the skills that they do possess. The secondary teachers possess greater skill with the technology but their use is limited. They are primarily using the computer as a resource, and that, at a Mechanical Level of Use. Elementary teachers have a limited skill with the technology but are striving to use the technology for more than a resource. They are limited, however, in their use, beyond students doing word processing, by their lack of knowledge and lack of access to technology.

Of greatest consequence are the concerns expressed by the participants. Many of the participants feel that they are being pressured by the administration to change computer operating platforms. This has proven to be a major block in the dissemination of the project. This was discussed after the interviews conducted in the fall, and it continues to be a block. The Information concerns of the participants have not been addressed. Participants need and want to be informed about the greater picture of this project. They want to know where the project is going. Is the long-term support available so that this project can continue? Are funds available to purchase the hardware and software necessary to effectively and efficiently integrate technology within the curriculum? Will technical support be available? Will training continue? These Personal concerns could greatly interfere with the participants' ability to take full advantage of this project. Their questions need to be answered.

Recommendations

Following are a series of recommendations made based upon our conversations with the project participants. Many of the participants had unanswered questions and unanswered concerns. All of these are potential roadblocks to the success of this project.

1. We recommend that *an informal meeting* be held with the educators participating in this project. At this meeting the following issues need to be discussed:
    - What is the "phase-in" approach for this project?
    - What are the plans for expansion? Who is getting what? When? What are the plans for continued funding support by the district?
    - Where is this project going?
    - What is the time line for training? What will be taught?
    - How will the participants know when they are finished with training?
    - Integration training? When, where, how?

2. *Share the vision* with the participants. Allow time for teachers who are currently integrating technology within the curriculum to share some of the activities they do with their students. Either provide time in a meeting for a group "show and tell" or, better yet, provide teachers release time to actually visit classrooms that are currently integrating technology.

3. *Address the platform issue.* There seems to be quite a bit of strife over the mandated shift from Macintosh® computers to Windows-based computers. A compromise needs to be reached. Perhaps the model that has been implemented in Glendo could be followed. All Macintosh computers have been moved to the middle school and the new PCs are going in to the high school. It is very possible to run Macs and PCs on the same server—Novel and NT both allow this and it is not too difficult.

4. *Address "access" concerns* —all the training in the world is of no use if there are not computers for the teachers to use, with students, once they have gained the skills.

5. Provide integration training on how to work within the realm of the *one-computer classroom.*

6. Gain further community support by *informing parents* about the project that is being implemented.

Research Paper: Connecting Technology to Teaching and Learning

eEducation: Interdisciplinary Crossroads

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> The world of e-business is percolating so far up into every field, said General Motors Vice President and CIO Ralph Szygenda, that he expects every graduate that walks into his office looking for a job to have e-commerce knowledge—both about the nuts and bolts of the technology and the business understanding to go along with it. (Vaas, 1999, p. 69)

Introduction

It is 1974. Ohio State University has just published *Making Toys through Teamwork*. As fifth- and sixth-grade students manage their toy companies, they not only learn the techniques of wood construction and mass production but also inductively develop an understanding of marketing principles.

It is 1980. Seymour Papert polishes his final draft of *Mindstorms*, advocating a constructionist approach to education, in which learners construct knowledge by solving reality-based problems, exploring the limits of their own understanding.

It is 1990. Tim Berners-Lee prepares to introduce the world to the World Wide Web, an event that inadvertently begins to rewrite the rules of how marketers interact with their customers.

It is February 1999, and the confluence of these three events is about to change the way students at a small New England college think about marketing, technology, and their role in enterprise.

This paper presents the framework we used in implementing Marketing on the Web, an interdisciplinary course that integrates marketing and technology strategies. We have grounded our approach in cognitive psychology (Piaget, 1967, 1970; Rumelhart & Norman, 1978) and in constructionist theory (Papert, 1980, 1993, 1996). While we have applied the framework at the undergraduate college level, it may profitably be adapted to other levels, primary through graduate.

The course is co-taught by two faculty: one from computer information systems (CIS) and one from marketing. It is designed to provide a unique opportunity for students to build on and integrate the concepts and skills acquired in prior semesters. It affords students an opportunity not only to expand and extend their Web development skills but also to understand that they must be applied in a directed manner if they are to be of value in solving business problems. Marketing concepts come alive as students, no longer constrained to studying theory and analyzing the work of others, become active participants. Experimenting, creating, revising, discussing, publishing, and reflecting on works of their own, they understand theory through action and experience the business value of technology through its application. In an environment made possible only through an interdisciplinary approach students are getting an eEducation.

Conceptual Foundation

In 1980 Seymour Papert championed the superiority of "learning by doing" in *Mindstorms: Children, Computers and Powerful Ideas,* which laid out a conceptual framework for how computers could be used in education. He termed his approach *constructionism*[1]. These ideas were later expanded in *The Children's Machine* (1993) and *The Connected Family* (1996). Papert's thesis is that "old" ways of learning were artifices of the available technology—books, teachers to lecture, paper, and pencils. Computers, he suggests, allow people to learn in a more innate fashion. He argues that this internally driven learning, in which people learn "what they need to know in order to carry things out," is a superior educational process. Following this model, the role of the teacher is to create the conditions for discovery rather than to provide ready-made knowledge (Papert, 1996, p. 45).

Papert articulated the concept in a 1983 speech in which he draws a distinction between teaching and learning.

> Teaching denotes a kind of fluidic theory of learning in which litres of knowledge fluid are transferred from the teacher vessel to a student vessel. We have this notion of the student being filled up from the wise container known as the teacher. I always like the [term] learning because learning denotes the process that is happening in the learner. I think what we really want to happen in education is to get that process energized and going because then the learners can function as they must for most of their life without depending on an explicit teacher. (Harper, 1989, p. 62)

Active learning is the hallmark of Papert's constructivist theory. His basic insight on the potential of active learning is the principle behind the phenomenon observed by Ohio State a quarter of a century ago as well as the one we employ in Marketing on the Web. As students do marketing they learn marketing. Active learning has been a recognized educational goal within the educational community for some time. Teachers have tried various approaches to experiential learning in the university classroom including the use of creative questioning techniques (Hallgren, 1982), data collection and analysis projects (McCorkle, Denny, Diriker, & Alexander, 1992), participatory examinations (Graham, Graham, & Whiting, 1997), as well as case analyses and research projects. While these are effective improvements to a straight lecture/discussion format, none provides the constructivist learning environment advocated by Papert.

Instructional Strategy

Papert's model was based largely on the work of Jean Piaget (Harper, 1989), who coined the phrase, "to understand is to invent" (Papert, 1996). Piaget advocated an environment that stimulates the learner to build his/her own intellectual structures through planning, estimation, interaction, experience, revision, and extension (Watts, 1989).

Papert's and Piaget's ideas have been extended by other researchers interested in learning and curriculum design. Two are of particular interest for this paper. Marzano (1992) employed constructivism as a basis for developing curriculum planning principles, which he termed "dimensions of learning." Reid, Forrestal, and Cook (1989) were interested in articulating the phases of successful collaborative learning projects. Table 1 presents these approaches side by side. We found that patterning our course around the five instructional principles suggested by Marzano and Reid et al. does indeed create an effective active learning environment. Further, the interdisciplinary nature of the course significantly promotes the constructivist goal of allowing students to create their own knowledge structures. The following five sections provide the explanations.

Table 1. Constructivist Theory and Two Applications

Piaget/Papert	Marzano (1992) Dimensions of Learning	Reid et al. (1989) Collaborative Learning Phases
	Attitudes and Perceptions About Learning (Motivation)	Engagement
Planning and Estimation	Acquiring and Integrating Knowledge	Exploration
Interaction	Extending and Refining Knowledge	Transformation
Experience	Using Knowledge Meaningfully	Presentation
Revision and Extension	Productive Habits of Mind	Reflection

Motivation: The Engagement Phase

> When the consumer looks at a Web page or a banner, the information that is presented there is processed by the human mind in several separate stages. Each of these stages is like a gateway. If the information does not make it past a stage, it is lost and the consumer has not been impacted by it.... The stages are (1) exposure, (2) attention, (3) comprehension ... (Hofacker, 2000, p. 47)

As any teacher can attest, the perception process (previously outlined by Hofacker) employed by marketers and communication experts applies equally well to the learning process. Exposing students to a problem is not enough; you also have to get their attention. For students to engage in active learning they must be inspired to solve a problem—ideally they should be absorbed by it. Students may view problems as engaging because they are novel, difficult, paradoxical, relevant, and the like. The opportunity to display their results on a Web page may in itself provide the required motivation (Abita, 1999; Batty-Hotz, 1999). But not everyone finds the same problems compelling. How does one choose problems that will appeal to each member of an entire class?

The importance of presenting authentic, relevant problems has been emphasized by teachers across specific subject areas including computer applications (Lowther, 1999), writing (Romano & Romano, 1999), science, and business (Joyner & Pedersen, 1998), as well as in the general curriculum (Norton, 1999; Williams & Merideth, 1997). Following the Piagetian model, we would add that allocating some portion of the problem domain to the students themselves greatly enhances the probability of each student finding a problem compelling. We recently gave students in Marketing on the Web the task of developing a Web site for a small candy producer. One group centered on the sexy, romantic image associated with the exchange of candy, while another focused on the stereotypical busy executive whose main concern is minimizing the time required to schedule the reliable delivery of candy for special occasions. Both groups presented their problem statement with zeal. Each had taken ownership of a problem it wanted to solve.

It is worth noting that students, for the most part, do not seek out easy problems. As Papert points out, "Most dislike of school work comes from finding it boring, the exact opposite of finding it too difficult. *Children, like everyone else, don't want 'easy'-they want 'challenging' and 'interesting'-and this implies 'hard'"* (Papert, 1996, p. 52; emphasis in the original).

A side effect of giving students the freedom to explore the problem space is that they regularly bring fresh perspectives to the subject. We often found ourselves thinking, "Wow, how'd she think of that ... I couldn't do that!" Why couldn't we? Probably because we are too familiar with the subject. If you want to know about pebbles ask a two-year-old. To us they're gravel—to a two-year-old they're fascinating.

Acquiring and Integrating Knowledge: The Exploration Phase

Having explored the *problem* domain students begin to explore the *solution* space. To select a solution strategy they need information. Students also need to consider how a decision made in one area will affect other areas. If they design the site to enable direct sales, for example, what technological requirements does that decision entail? What effect will it have on their dealer network? Is the company equipped to handle direct orders, returns, and billing? Knowledge becomes active. Students seek out the information they need to solve the problem they defined.

In this exploration phase the value of an interdisciplinary course is most conspicuous. To be successful, students have to think beyond their current perspectives to incorporate new ones. Students are asked to refocus, to view a business problem from a new, broader enterprise perspective. CIS majors add marketing insights to their technological expertise; marketing majors learn to incorporate technology strategies in to their planning procedures. This process is difficult. Students have to make the conscious effort to create cognitive space for the new material. If accomplished successfully, the end result is a more sophisticated perspective. As Anderson suggests, "Schema change is the 'sine qua non' of the acquisition of knowledge as opposed to the mere aggregation of information" (1977, p. 430). Put more prosaically, the student now begins to see the elephant, not just the trunk (or the foot, or the tail ...).

Extending and Refining Knowledge: The Transformation Phase

As students begin to design their Web sites, controlled environments with which customers interact, they must transform their knowledge and theories into reality. Following the Piagetian model, the best place for this transformation to take place is an intellectual playground, a responsive learning environment they can explore and extend. The microworld of a Web site provides this environment. It furnishes a set of primitives (text, graphics, sounds, data, bandwidth) and a set of constructs for organizing and acting on those primitives (hypertext markup language [HTML], pages, tables, frames, hypertext links, animations, forms). To this we add a set of marketing constructs. Students use these elements to create (invent) environments uniquely their own. Their creations reflect the goals they have established for their sites and their own individual styles in reaching those goals. Their success depends largely on the interplay between CIS and marketing concepts. Students constantly have to ask themselves questions such as "What other techniques and technologies might we use in constructing this Web site?" and "How will the target market react to a site that requires them first to download and install a Shockwave Plug-In?"

Throughout the course each Web site is always a work in progress. As students are exposed to new concepts and techniques they revise and extend their world to incorporate the new elements now at their disposal, thereby completing the constructivist loop. Feedback is ultimately provided at several levels. In this phase it is provided by the Web directly to the individual or group developing the site—does the site look and behave the way the student wants it to?

Using Knowledge Meaningfully: The Presentation Phase

Students are now ready to test their knowledge with a wider audience. As every teacher knows, we never learn a subject quite so well as when we have to explain it to someone else (Papert, 1993, p. 162). This same principle applies in a constructivist classroom. Students not only need to expand, modify, and build their knowledge structures, but they also have to be able to *communicate* that knowledge.

We facilitate this process by developing a critical ethic in the class, providing a second level of feedback. Beginning with the first week of classes, students critique each other's work orally. To discuss and comment on the effectiveness of their work, students must reflect on the criteria and standards of good marketing and good Web design. What is the apparent target market for the site? Does the intended message agree with the apparent one? Do animated GIFs enhance or detract from the site's purpose?

A third level of feedback comes from the instructors. We function as coaches, suggesting other areas the team may want to consider and helping students with difficult concepts. As much as possible, however, we try to avoid what Papert (1993) refers to as the intolerant insistence on "right" answers. Instead of pushing students to get it "exactly right" the first time, we adopted Papert's approach of helping students get it "vaguely right," so that there is room for them to redirect their efforts. The microworld of a Web site greatly facilitates this process. Students can easily try out different approaches, make changes and alterations—even completely change directions—in response to their own ideas and the critiques of classmates.

Productive Habits of Mind: The Reflection Phase

The constructivist philosophy is attractive because it engenders learning independence in students. As they take responsibility for their own education, they are also developing what Marzano refers to as productive habits of mind, mental processes that should stay with them throughout their lives, processes such as critical-thinking skills, an appreciation for learning strategies, and team skills.

The interdisciplinary nature of Marketing on the Web naturally leads to an environment that promotes the development of these processes. Reid et al. (1989) suggest that successful collaborative learning assignments must be complex enough so that a group with multiple perspectives and multiple knowledge sets is perceived to be better equipped to solve the problem than a group without these resources. A complex interdisciplinary problem would be of little value, however, if we were to allow the formation of homogeneous teams. Scholars have long known that heterogeneous groups render higher-quality decisions than homogeneous groups do (Fisher, 1980; Jensen & Chilberg, 1991). A diverse group brings different perspectives to bear on an issue. If group members are motivated to express their ideas and to listen to others, the result is a fuller consideration of a problem's complexities and alternative resolutions. We engender cross-fertilization by purposely balancing team membership so that neither CIS nor marketing majors dominate. Additionally, requiring that non-CIS majors explain the technology strategy and that CIS majors explain the marketing strategy during class presentations and critiques further engenders the exploration of alternative schema.

The complex interdisciplinary problem environment also fosters an appreciation for learning about learning. Success depends largely on the ability of each group member to assimilate the concepts and techniques of the "foreign" discipline. Much as a child with the latest video game wants to be the first on the block to master it, groups that find efficient means of cross-fertilization are the first to bear fruit. It is not that they are having so much fun that they don't know they are learning. Rather they see learning as a desirable goal and look for better ways to accomplish it.

We would also submit that an interdisciplinary course by its very nature adds an important collaborative layer: the interplay between the disciplines—in this instance marketing and CIS—which is personified by the collaboration between the instructors. We have found it helpful, for example, for the CIS professor to express the importance of supporting a Web site's development strategy with good marketing theory. CIS students seem to perceive his admonition not to overdo the whiz-bang of technology as more valid than when the same comment comes from the marketing professor.

The Obvious Question

At this point, the reader may be thinking, "If I divert class time to teach Web development (marketing), won't I have to cut out some of the marketing (Web development) content I cover?" There are two problems with this line of thinking. First, it assumes that marketing and computer information systems are separate and distinct disciplines. In the real world of enterprise development there is considerable overlap. The second problem, while less obvious, is just as important. It relates to the economic theory of roundabout production proposed by Böhm-Bawerk (1932) and Richard Ely (1902)—if your economics class had been constructivist-based you'd remember them!

Consider two tailors in the 1850s, about the time of Elias Howe, A. B. Wilson, and Isaac Singer. One decides to forego some current production and invest time and resources in one of those newfangled sewing machines (roundabout production); the other doesn't. The tailors quickly discover that he who invests in and applies the best tools wins. As the chair of the Utah Strategic Planning Commission observed in 1988, "Throughout history, every significant increase in human productivity has involved the better use of tools" (Thomas & Knezek, 1995).

Does this principle apply to education as well as economics? There is evidence that it does. Cutting (1990) provides an apt example. He was teaching Prolog programming to undergraduates who had no prior computer experience. To do useful work with Prolog, students had to understand the concept of *recursion*. Recursion is a difficult concept and a significant number of students were unable to master it in the allotted time. While Prolog relies on recursive techniques, it is not a particularly good tool for teaching them. Logo, on the other hand, is an excellent tool for teaching recursion. Cutting found that students who first learned Logo, followed by Prolog, were able to do more with Prolog than students who spent comparable total time on Prolog alone. By investing time to learn Logo he was able to cover more material, not less.

We suggest that the same principle applies to integrating Web development with marketing. Marketing provides a context-rich environment ideal for understanding how Web development theory and techniques can be applied in a business setting. Rather than simply developing a "cool" Web site, students develop an appreciation for how technological expertise can add value to an organization's marketing strategy. Each discipline serves as an effective tool for understanding the other.

Conclusion

John Dewey (1916) once said that the goal of education is not just to acquire information, but to be able to apply it. His thoughts echo almost a century later in the comments of General Motors Vice President and CIO Ralph Szygenda in our introductory quotation. We suggest that if Dewey were alive today, he would very much favor an interdisciplinary eEducation.

An environment that motivates students to take an active role in the learning process, allows them to apply their newfound knowledge to real problems, and encourages them to push the limits of their understanding certainly is one that enhances education. Ohio State discovered this truth a quarter of a century ago with its Making Toys through Teamwork curriculum. Seymour Papert championed the idea almost 20 years ago. A decade ago Tim Berners-Lee developed a revolutionary new system for the exchange of information throughout the scientific community. In the process, he gave us not only a new medium for marketing but also a new environment, a technological playground for marketing theory, which makes it possible for us to realize Dewey's dream and meet Szygenda's expectations.

We are not alone in promoting the benefits of incorporating the Internet in to the classroom. What is different about our approach, however, is its interdisciplinary focus in which the technology is more than just a tool. Students learn the importance of developing a technology strategy consonant with an organization's marketing strategy.

Areas for Further Research

A course of this type has advantages beyond reinforcing, extending, and integrating concepts acquired in previous classes. Interdisciplinary courses would seem to be effective vehicles for *introducing* students to those topics as well. If true understanding comes from building complex intellectual structures with associative links among concepts, then students would benefit from being introduced to this process early in their educational careers. As with other learning environments based on constructionism, a course such as this one could be taught at a wide range of grade levels, from secondary school through college. Virginia's *Make It Your Business* curriculum for Grades 6–9 (*Guide to Marketing Course Competencies*, 1996) is one example. It appears to us that integrated courses could target Areas 3 (Conducting a Needs Assessment), 4 (Planning the Product or Service), and 5 (Preparing a Marketing Strategy) of that program. Would it fit in your curriculum as well? We would appreciate feedback …

Note

[1] Papert invented the term *constructionism* to distinguish his concept from that of Piaget. He says that "The name constructionism derives from an alternative model, according to which the learner has to *construct* knowledge afresh every time" (Papert, 1996, p. 45). He also notes that "my word will evoke the term *constructivism*, whose contemporary educational use is most commonly referred back to Piaget's doctrine that knowledge simply cannot be 'transmitted' or 'conveyed ready made' to another person" (Papert, 1993, p. 142).

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Research Paper: Connecting Technology to Teaching and Learning

Web-Based Extended Learning through Discussion Forums

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Key Words: **Web-based interactive learning, Internet, intranet, shared learning, discussion board**

Introduction and Rationale

As the intranet/Internet is introduced in to the learning environment of the classroom today, the effects of this technological environment must begin to be studied. Technology offers an opportunity to affect and monitor academic behaviors such as problem-solving ability and metacognitive reflection. However, what evidence can be found that speaks to the effectiveness of the use of such learning places? Can a model for visualizing any level of effectiveness be generated for such environments?

As technology creates a virtual classroom environment as it moves to a Web-based space, questions arise regarding the effectiveness of such geographically unrestricted, collaborative problem-solving places (Jacobsen & Levin, 1993). Collaborative designs such as these become possible when the learning environment is placed within a Web of computers, thereby facilitating and encouraging access by many to a shared intranet/Internet Web-place.

As students use the collaborative capabilities of a networked intranet learning environment, thinking about their own thinking evolves, thereby increasing the opportunity to clarify misconceptions of knowledge, procedural or declarative. The science classroom presents one opportunity to study the effects of a shared intranet environment on student problem-solving ability and metacognitive reflection skills through shared contextualization. Field study data collection, posting, and discussion create a context, or anchor (Brown et al., 1989), for this virtual learning environment based on real, concrete information.

Questions Researched

As part of a secondary research question, an evaluative analysis of the CourseInfo software (Blackboard, Inc., 1998) was undertaken. The tracking capabilities of the CourseInfo software were evaluated through measurement of (1) the number of log-ons to the threaded discussion Web page, (2) the number of threaded statements, (3) the number of threaded dialogue statements of response to other student statements, and (4) the number of threaded dialogue statements of response to teacher statements.

Analysis of tracked user movement within the shared Web-based environment was investigated as one possible model of evaluating learner academic behaviors within, and as a result of, Web-based environments. While further analysis is needed, results of this study support tracking user movement as an avenue of quantifying the effectiveness of Web-based learning initiatives.

Study Background

Subjects

Subjects for this study were first-time 9th- and 10th-grade biology students from three public education high schools in the Conroe ISD within Conroe, Texas. The sample (n) contained 78 students of the 1,400 students enrolled in Biology I courses. Two classes from each school were selected and randomly assigned to a control class and a treatment class. Selected campuses operated on an A-B, 90-minute class alternating block schedule.

Technology

Participants assigned to treatment groups received access to technology. This technology included Macintosh® platform computers. Scanners, digital cameras, Internet connections, and laser printers rounded out the technology utilized by the treatment groups. Software access included Apple® QuickTake® PhotoNow software, HP® scanning software, Microsoft® Office, Netscape Navigator® Gold 3.0, and Inspiration® 4.0.

Ecology Curriculum

Teachers at selected campuses received an Adopt-a-Ditch ecology curriculum (Stone & Myers, 1994). This modified curriculum provided the context for the Web-based learning environment. Training for all curriculum lessons, the LaMotte Freshwater Testing Kits, and the Web-based database was provided. Spontaneously generated forum topics were noted as the researcher analyzed collected data within the Web-based learning environment.

Teacher Training

Technology training consisted of instruction and practice in using the CourseInfo intranet simulation software (Blackboard, Inc., 1998), uploading and downloading Inspiration files through the Internet, using a digital camera and downloading images, working with Excel spreadsheets and graphics, and using the discussion forum environment.

Software Background

A secondary intent of this study was to provide evaluative discussion of the software product used to create the shared learning environment. As this newly developed distance education software product was in the process of being piloted by a variety of institutions and research programs, permission for its use as part of this study was obtained (from Blackboard, Inc.). Agreements between the author and software developers included evaluative information resulting from use of the product, taking into consideration the constraints of its application within the nature of the study. Results addressing the secondary research question focused on an examination of tracked user movement findings, discussion forum findings, and difficulties experienced during use of the software product.

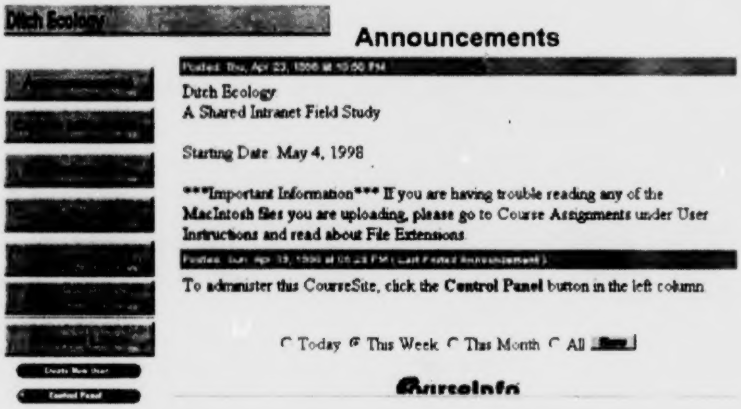
One caveat exists as a part of answering this secondary research question. It is imperative to remember that this section's evaluative basis remains the by-product of this particular study. As many other piloted uses of this product have occurred, or are presently ongoing, this author suggests that additional review of other evaluative efforts be examined should any future use of the product be initiated.

Further, it must be noted that use of the product within this study represents a model whereby security access was granted to all subjects within the study. This type of widespread access is not the usual mode of access suggested by the developers. However, this approach was utilized to create a more constructivist (Jonassen, 1996), shared environment given the nature of the software product. Therefore, review of the secondary research question findings should occur with forethought of these caveats. Future users of this software product should consider the type of learning environment they envision, as well as the learning philosophy underpinning that environment, as this study's findings of the software are taken into account.

Software Capabilities within the Model of Study

Tracked User Movement

CourseInfo software provides a database of user movement patterns once entry in to the Web site occurs (see Figure 1). Analysis of recorded user movement can be obtained for a variety of statistical views of user movement.



Announcements

Dutch Ecology
A Shared Intranet Field Study

Starting Date May 4, 1998

Important Information If you are having trouble reading any of the MacIntosh files you are uploading, please go to Course Assignments under User Instructions and read about File Extensions

To administer this CourseSite, click the **Control Panel** button in the left column

○ Today ● This Week ○ This Month ○ All

Figure 1. Announcement page for Web-based learning environment.

These statistical views were made available through the CourseSite Stats option accessible with a security password through the control panel. Views (analyses) available include: (1) traffic hits for the entire course site; (2) traffic hits by each page within the course site (see Figure 2); (3) traffic hits by date; (4) traffic hits by time and by links (see Figure 3); (5) traffic hits by countries, visitors, and browsers; and (6) filtering the preceding information by server domain.

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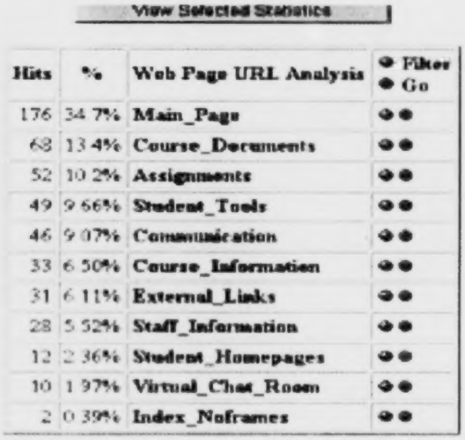

Hits	%	Web Page URL Analysis	● Filter ● Go
176	34 7%	Main_Page	● ●
68	13 4%	Course_Documents	● ●
52	10 2%	Assignments	● ●
49	9 66%	Student_Tools	● ●
46	9 07%	Communication	● ●
33	6 50%	Course_Information	● ●
31	6 11%	External_Links	● ●
28	5 52%	Staff_Information	● ●
12	2 36%	Student_Homepages	● ●
10	1 97%	Virtual_Chat_Room	● ●
2	0 39%	Index_Noframes	● ●

Figure 2. Movement analysis by Web-site page.

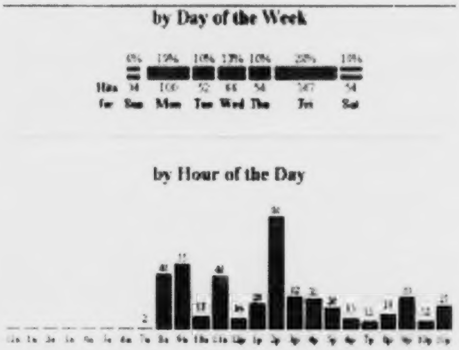

Figure 3. Analysis by Web-site day and time.

As a part of the study, tracked user movement generated information related to several aspects of user movement. Repeated visits (interpreted as level of traffic) can be connected to user preferences related to Web-page function, design, or information. The total number of hits can indicate to some degree user time within the shared learning environment in general. Evaluating which pages were accessed during the study could indicate depth and type of use of the shared environment. Use of help pages within the shared environment could imply use in a self-sufficient way. Finally, tracked use of the discussion board provided information as to the development of the entire study group, the collaborative extent of the group, and student-initiated discussion. Tracked user movement, identified movement by page title, and number of traffic hits, as well as percentages, were summarized (see Figure 4).

Analysis of user movement by page indicated entrance in to the shared environment through the main page. The Course Documents page was used with the most frequency (13.3%) after entering the shared environment. This page provided the storage location for uploaded files (graphs, images, and documents) for all participants. All files accessed through this page by any participant were viewed or downloaded. Use of the

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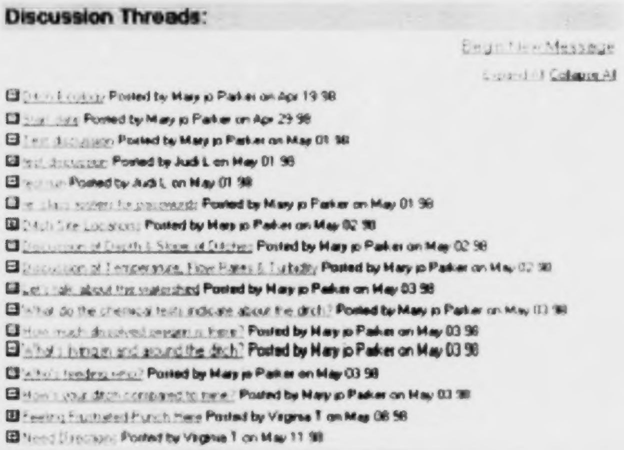
Assignments page incurred 9.8% of the hits. This page held sample files and user instructions for the various activity demands of the ecology curriculum. The limited use of this page simulated the nature of FAQs pages in other Web sites, that is, it remained relatively unused. The third most frequented page within the Web site was the student Tools page, at 11.9%, indicating that help pages entitled Tools seem to be more frequently accessed by novice users than pages titled in other ways.



Discussion Threads:

Begin New Message

Expand All Collapse All

- Ditch Ecology Posted by Mary jo Parker on Apr 19 98
- [illegible] Posted by Mary jo Parker on Apr 29 98
- Test discussion Posted by Mary jo Parker on May 01 98
- test discussion Posted by Judi L on May 01 98
- [illegible] Posted by Judi L on May 01 98
- [illegible] Posted by Mary jo Parker on May 01 98
- Ditch Site Locations Posted by Mary jo Parker on May 02 98
- Discussion of Depth & Slope of Ditches Posted by Mary jo Parker on May 02 98
- Discussion of Temperature, Flow Rates & Turbidity Posted by Mary jo Parker on May 02 98
- Let's talk about the watershed Posted by Mary jo Parker on May 03 98
- What do the chemical tests indicate about the ditch? Posted by Mary jo Parker on May 03 98
- How much dissolved oxygen is here? Posted by Mary jo Parker on May 03 98
- What's living in and around the ditch? Posted by Mary jo Parker on May 03 98
- Who's feeding who? Posted by Mary jo Parker on May 03 98
- How's your ditch compared to mine? Posted by Mary jo Parker on May 03 98
- Feeling Frustrated Punch Here Posted by Virginia T on May 08 98
- Need Directions Posted by Virginia T on May 11 98

Figure 4. Sample discussion threads used in tracking learner movements.

An analysis of user movement by date was undertaken as an indicator of the overall use of the shared environment. Table 1 contains a use-by-date display of user movement within the Web site. Examination of use-by-date hits, filtered through server domain, provides evidence of the site's extension of interactivity between time and the users. At first glance an appearance of minimal use might be seen in the small number of hits and the low percentages. However, closer examination indicates that in an A-B block schedule hits were recorded for each day of the school week. This looms important as it suggests that in some way students gained access to the shared Web-based environment during days when no science class was scheduled.

Discussion Forum Findings

Analysis of the use of the shared environment's discussion board revealed much about the amount of time spent using a shared discussion place as well as about other previous discussion forum experiences within the classroom. Extrapolation of the number of hits associated with accessing the discussion board provided evidence of minimal use of this type of environment and technology, suggested a lack of previous exposure to the electronic sharing of ideas and information, and detected technical issues as the most pressing and reported discussion topics. The following sections address these extrapolations.

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Table 1. Analysis of User Movement by Date of Use for the Duration of Study

Date of Use	Day of the Month	Scheduled Study Dates	Hits	Percentage of Hits (%)
5-4-98	Monday	+	4	1.4
5-5-98	Tuesday		7	2.5
5-6-98	Wednesday	+	7	2.5
5-7-98	Thursday		8	2.8
5-8-98	Friday	+	103	39.2
5-11-98	Monday		70	24.7
5-12-98	Tuesday	+	16	5.7
5-13-98	Wednesday		27	9.5
5-14-98	Thursday	+	25	8.8
5-15-98	Friday		16	5.7
Total			283*	100.0

Note: The * denotes the number of hits remaining after discounting the number of hits recorded by the dissertation's author while monitoring the site.

Use of the shared discussion board

Originally, a total count of discussion threads posted by the author of the study was determined. Sixteen threads were initially established as "starters" for each of the activities in the ecology curriculum guide. The use of starter threads potentially enabled moderation and enumeration of topics by the author or by each campus teacher. A count of the number of discussion responses indicated very little activity within the shared discussion board. Minimal new discussion threads were originated through the duration of the study. The lack of discussion threads or responses seemed surprisingly low considering that each curriculum activity included responses to the discussion board topics as indicated in each activity directions. Analysis of discussion threads and responses suggested little time of use within the forum opportunity of the site. Only five new discussion threads were recorded over the duration of the study. Of the new threads recorded only one came from a student. Efforts to understand this lack of activity brought focus to the nature of the discussion threads or response messages actually recorded within the discussion forum.

Nature of the discussion forum threads and responses

A review of the content of the discussion threads created by teachers and students indicated their experiences with technical difficulties associated with some aspect of the various technologies involved in the study. Primarily, use of the uploading and downloading capabilities presented time-consuming difficulties as apparent in the number of discussion threads and responses made by teachers and the one student discussion response dealing with this aspect of the study. Additionally, qualitative analysis of the dissertation author's discussion responses suggests frustrations and needed help on the part of the writers of the responses. In some instances the discussion thread titles indicated the degree of technical problems being experienced: "Feeling Frustrated-Punch Here," "Need Directions," or "Need Directions too."

An analysis of the dates of the forum threads and responses provides additional evidence of the minimal use of the discussion forum as well as potential reasons for this lack of use. The dates of teacher and student discussion threads and responses seemed to indicate initial use occurred late in the study and did not follow the curriculum guide of activities. Table 2 summarizes discussion threads and responses by date.

Table 2 seems to suggest that the teachers, at least, were beginning to try to use the forum as a place to share difficulties as well as a place for seeking help. When dissertation author discussion threads and responses were analyzed, all appeared to address technical issues inherent in the software or in the computer platform providing technology capabilities.

Table 2. Summary of Discussion Threads and Responses by Date

Discussion Thread Titles	Date	Respondent
Test Discussion	May 1	Teacher
Test Run	May 1	Teacher
Feeling Frustrated-Punch Here	May 8	Teacher
Need Directions	May 11	Student
Need Directions too	May 11	Teacher
Discussion Response Titles		
Re: Ditch Site Locations	May 5	Teacher

Difficulties Experienced Using CourseInfo Software

Examination of uploaded files and discussion forum transcripts provided evidence of a variety of difficulties experienced with the piloted software. These difficulties seemed to cluster around novice user levels of the participants, computer platform inconsistencies, and software security issues.

When an initial survey of all uploads in to the CourseInfo ditch ecology site was performed, upload attempts provided evidence that use of the site by students was high. However, this same information suggested that the on-site help pages and on-hand training documents had not been accessed during initial uploads, as many attempts to upload were to incorrect locations.

Once user uploads were found, attempts to open and view each was made. This was initially undertaken by the dissertation author to ensure the viewability of the data. Computer platform issues came into evidence during this phase for all campus users. All campus users operated Macintosh platforms that automatically upload files with no preassigned file extension added to the file name. PC platforms and software automatically preassign the file type extension to a file name, thereby enabling identification of the file type. This became critical within the CourseInfo environment as each uploaded file, when opened, launched a copy of the application needed for readability. The lack of automatic assignment of file type extensions as a result of Macintosh platform use caused initial uploads by each campus to be unreadable. This issue created multiple upload attempts of the same data and high frustration levels among the users uploading.

Summary

The secondary research question attempts to identify academic behaviors that can be tracked within a shared Web-based learning environment such as that offered by the piloted CourseInfo software. Identifying user movement patterns in Web-based environments and discussion forum patterns as well as attempting to ascribe meaning to these movement patterns by connecting these movements to academic problem-solving and metacognitive reflection offers much potential for understanding these new learning environments. Connecting meaning to these movement trends within the context of the shared Web-based environment may be the most interesting, potentially meaningful aspect of this study.

As shared Web-based learning environments within secondary classrooms experience rising use, models focused on understanding the critical elements of effectiveness of these environments seem necessary, rather than novel. Tracking user movement and discussion forum patterns offers a potential way of documenting and quantifying learner critical thinking and metacognitive reflection within a Web-based learning environment. Tracking movements and discussion forum patterns provides one method of assessment within the Web-based environment that can be maintained behind the scenes without interference to the learner and without overt, game-like feedback. This type of assessment informs instruction, the instructor, and the learning environment. The potential exists for measuring the effect of the environment through the learner's movement patterns, thereby offering the possibility of creating an optimum learning environment for each and every type of learner.

The richness of shared data, data examination, and learner insights follows naturally from analyzing user movement patterns. Moving learner metacognitive reflection capabilities to a Web-based learning environment presents the academic accountability often missing from current models of Web-based learning. Not only depth of knowledge, but also critical-thinking levels, can begin to be warehoused for constructive use by each learner/user.

Contextualizing Web-based learning environments with real-time scientific data collection and evaluative activities appears to favorably support the improvement of academic behaviors. Given the strong emergence of distance education initiatives, evaluating and assessing these behaviors within the Web-based learning environment becomes ever more important. Add to this the constructivist nature associated with this study's model, and the power and empowerment of this type of Web-based learning place becomes awesome, and needed.

Future Implications

The results of this study present one practical model for infusing technology in to the classroom setting; for improving problem-solving ability and metacognitive reflection over a short duration; for creating a collaborative, cooperative learning space; and for maintaining a science space for learning where no gender differences arise.

The power an intranet offers within the constraints of a school district, or geographic locale, has not yet been tapped. This study proposes one mechanism for doing just that given the infrastructure present or absent through the use of a Web-based intranet. This model offers a "get your feet wet" method of networked connectivity for classrooms and teachers who have not yet jumped in to the World Wide Web.

This research provides a study in contextualizing connectivity with end goals of improved problem-solving and metacognitive reflection. Both of these elements are often lost when initial attempts to jump in to networked learning occur or are contemplated. Further, this study provides an avenue of documenting the nature of learning during the use of Web browsing or other networked connections. Tracking learner movements within a browsed Web site has metacognitive as well as problem-solving implications for each and every learner.

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Research Paper: Moving Beyond the Crossroads: Teachers as Agents for Change

Images of Teaching with Computer Technology: A Metaphorical Perspective

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Key Words: metaphors, images, teaching actions, computer technology integration

There has been keen ongoing interest in how teachers integrate computer technology in to their teaching (Dias, 1999; Hadley & Sheingold, 1993; Sandholtz, Ringstaff, & Dwyer, 1997). The aim of this research is to describe how teachers' images of teaching with computer technology can be a means to understanding how they construct meaning in their integration of computer technology in to their teaching.

This paper focuses on the actions of teaching through teachers' images of their teaching with computer technology integration in to teaching-learning environments: the way the teaching process is structured by teachers' relationships with computer technology and how this relationship defines their work (Bigum, 1997) and their "thoughts, voice and experiences" (Budin, 1999, p. 668). It also focuses on how teachers themselves comprehend and convey their roles (Budin, 1991) and thus search for a new paradigm or paradigms that encompass these roles (Kerr, 1991). These insights may shed light on the range of opportunities afforded by technology from the teachers' perspectives.

Salomon (1998) argues that the technological affordances provided by computer technology offer needed tools and novel teaching-learning opportunities in classroom teaching. This, he states, requires novel psychological insights to materialize in the classroom. Salomon claims that human understanding of cognition and the technologies they develop and utilize as tools for teaching are comprehended metaphorically. Both are thus linked, as the following quote signifies:

> Historically, our understandings of the human psyche, particularly cognition and the technology we employ as metaphor or as tools for teaching tend to go hand in hand … this parallelism between our psychological understandings and the technologies available to us remain unchanged…. The way we believe people learn and think and the information technologies we develop to make that possible continue to live in a tight, reciprocally supportive marriage. (Salomon, 1998, p. 4)

An implication garnered from this perspective strengthens the notion that the way we conceptualize our psychological insights in relation to pedagogical actions afforded by technologies can be conveyed as metaphors.

Thus the preceding brief review concurs with what Kerr (1996, p. 23) refers to as a new paradigm in research in technological affordances and teachers, "a person-centered vision for technology in education."

It is imperative to understand that teachers' relationships with computer technology integration may lead us to consider the nature of teachers' goals and how they fulfill them (Bromley & Apple, 1998). The essence of what teachers actually do in classrooms and a comprehension of their views—an in-depth "reappraisal" (Scimshaw, 1997, p. 112)—of teachers' use of computer technology may be revealed.

Method of the Study

Image is proposed as a construct to understand teachers' particularistic knowledge in the context of teaching with computer technology. This particularistic knowledge is defined as the "particulars of practice" providing a "rich picture" (Johnston, 1992, p. 124) of teaching actions with computer technology. The study reported in this paper has incorporated the utilization of teachers' metaphors as a tool to investigate teachers' images of teaching with computer technology.

By using metaphors to illuminate teachers' images, the study offers a means to comprehend how teachers see themselves teaching with computer technology. Metaphors provide a means to make explicit the teachers' language of practice and provide insights in to their teaching practice with computer technology leading to a discussion of teachers' construction of meaning (Collins & Green, 1990) with the integration of computer technology in to their teaching.

A Review of the Methodology Used to Elicit Teachers' Metaphors

The approaches to research on metaphors for teaching fall into two categories. The first category is the natural metaphoric language (Morine-Dershimer & Reeve, 1994) or speech metaphors (Connelly & Clandinin, 1988) that are prevalent in teacher discourse. The second category is the generation of verbal or written explicit metaphors (Marshall, 1990) or metaphorical statements (Gurney, 1995; Miller & Fredericks, 1988) by teachers resulting from assigned or instructional activities.

The speech metaphor analysis approach and metaphorical statement approach have both been extensively used in educational research. The identification and analysis of preservice and inservice teachers' metaphors have contributed to the understanding of teachers' thinking, professional knowledge, beliefs, teacher role conceptualizations, images of teaching, and teaching actions.

In the field of explicit metaphorical statements research, metaphors have been used to investigate the images of how teachers view themselves and their learners in the classroom (conceptions of teaching and learning; Gurney, 1995); images that teachers have of themselves in fulfilling their roles (Berliner, 1990); and the images of personal practical knowledge (Ritchie & Russell, 1991). The underlying themes in the utilization of metaphors in these areas of research were based on the assumptions that "images lead to metaphors"; "metaphors provide a careful means for clustering images"; and "images are metaphorically embedded" (Bullough, 1991, p. 200). Ritchie and Russell (1991) also claim that images are expressed as metaphors and that these metaphors make the images (embedded within the metaphors) graphic and visible.

The relationship between metaphors and images is expressed clearly by Calderhead and Robson (1991, as cited in Bullough & Stokes, 1994, p. 198):

> In fact being able to recall images and to adopt and manipulate these images in reflecting about action in a particular context is possibly an important aspect of the task of teaching....

> Images, whether representations or reconstructions, provide us with an indicator of teachers' knowledge attributable to different training experiences and the relationship between knowledge and observed practice.

Thus, metaphors can shed light on the images that teachers capture and encapsulate and refer to in the course of their teaching.

Research studies by Gurney (1995) and Miller and Fredericks (1988) have provided much support for the use of metaphorical statements. In a study conducted with preservice teachers' metaphorical statements of the teaching and learning process, Gurney demonstrated that metaphorical statements could be a device in the envisioning of teachers' conceptions of teaching. This, he suggested, could be done by analyzing metaphorical statements for themes and moods. Miller and Fredericks (1988), in a study involving 25 students in a sociology of education class, had also demonstrated that metaphorical statements helped to "reflect and structure individual experience" (p. 263) and claimed that metaphorical statements were viable as a "rich source of qualitative data" (p. 269).

On a final note, Dickmeyer (1989) has suggested that metaphors can depict an oversimplified view of the phenomenon under study. In this study such oversimplification is viewed as a "virtue" following the convention of Bullough (1991, p. 44). It is acknowledged that the simplification would enable the teachers to reflect on and analyze more easily their teaching with computer technology.

Data Collection

Data for this study were elicited by the second approach to the use of metaphors—explicit metaphors generated in response to an instructional task. The data collection consisted of three steps. First, teachers were instructed to write down personally constructed metaphors (Munby, 1987, as cited in Ritchie, 1994) in the form of explicit metaphorical statements. This was followed by teachers creating narratives (Tobin & Tippins, 1996) of selected metaphorical statements. The last step of this data collection stage involved the teachers' derivation of metaphors for the statement "The teacher as . . ." (Berliner, 1990; Ritchie, 1994; Ritchie & Russell, 1991; Tobin, 1990, 1993; Tobin & LaMaster, 1995; Tobin & Tippins, 1996) from the narratives of their respective metaphorical statements.

Step I: Generating Written Metaphors

The use of the metaphorical statement approach in this step followed the convention of Miller and Fredericks (1988), Gurney (1995), and Inbar (1991). The purpose of generating personal metaphors in this study was to capture and encapsulate participants' teaching actions with computer technology in graphic and visible ways.

In this study the six secondary school teachers from the Republic of Singapore were asked to write down three or four metaphors each for their teaching process with computer technology. Metaphors were elicited during the five-month research cycle. The teachers were asked:

> Please write three or four metaphors of your teaching process with computer technology.

The purpose of writing more than one metaphorical statement was to prevent teachers from responding to the task by giving a one-sided emphasis on selected aspects of the phenomenon under study (Inbar, 1991). In addition, Bullough (1991) cautioned that single metaphors would not suffice in capturing the phenomenon under study. All the metaphors were collected and compiled by the researcher.

Step II: Deriving Narratives from Metaphorical Statements

Following the verification process, the qualified metaphors (refer to Gurney, 1995, for a detailed process for qualification of metaphorical statements) were returned to the teachers for corroboration. This step followed the convention of Tobin and Tippins (1996) and Inbar (1991). Teachers were asked to select one metaphorical statement each that was representative of their teaching with computer technology from the metaphorical statements that they had written and that were verified. The teachers were then asked to read their respective chosen metaphors and describe the metaphor. The following phrase was used by the researcher to assist the teachers in explaining their metaphors.

> Choose one metaphor which is the most representative of your teaching with computer technology and please explain it in a few words.

The main purpose for this procedure was to make explicit the meaning underlying the chosen metaphors rather than rely on the researcher's interpretation of the meanings. Aspin (1984, p. 34) had stressed the need to use metaphors as a generative tool for educational discourse and not merely as "fixers or thought stoppers." In addition to that, Inbar (1991, p. 25) cited two important justifications for the preceding step: first, teachers' choices of representative metaphors were made explicit, revealing the "deeper meaning" that they had for the chosen metaphor, and second, teachers' explanations served as connections between the tacit and the explicit domains of their knowledge. Therefore, by exploring the narratives, a better perspective of the images of teaching with computer technology was focused on.

Step III: Creating Metaphors for "The teacher as ."

This stage involved the participants in reading their narratives three times and relating their narratives to the following phrase:

> Metaphors for "The teacher as ..."

Responses were transcribed by the researcher, and teachers were asked to verify their metaphor by reading their narratives again and confirming their choice of metaphor for "The teacher as ...".

The purpose for this procedure was to allow teachers to read their narratives in order to capture their own images of teaching with computer technology and encapsulate them in another metaphor. The narratives were the depiction of "actions, causes and consequences" (Lyle, 2000, p. 59) of teaching actions with computer technology integration. This step gave the teachers an opportunity to reflect on their own practices and look at the language they had assigned to their teaching actions (Briscoe, 1991). This was also a way for the teachers to "re-vision" (Connelly & Clandinin, 1988, p. 77) their construction of metaphorical sentences and related narratives, and to contextualise the teaching actions in another metaphor, thereby structuring one's teaching practices and making explicit personal practical knowledge.

Furthermore, by looking back at the construction of practice especially with computer technology, teachers were reflecting on what they perceived as the "visual imagery" (Berliner, 1990, p. 85) embodying the requirements of their roles in the classroom. In addition, "The teacher as ..." metaphors could reveal the thoughts and perceptions that teachers have of themselves (Anderson, 1995).

This process enabled the researcher to get a further set of coherent and consistent metaphors that alleviated the major concern of single metaphors not being enough to describe the complexities of the teaching process with computer technology.

Thus by eliciting a second set of metaphors from the teachers' own narratives, insights in to teachers' images of teaching actions were explored. Table 1 illustrates the data collection steps previously depicted.

Table 1. Components of the Data-Gathering Process by Steps of Occurrence

Data Collection Actions	Instructions That Prompted Actions	Data That Actions Produced
Step I: Personally Written Metaphors		
Collection of metaphorical statements from teachers.	"Please write three or four metaphors for your teaching process with computer technology."	Teachers' handwritten metaphorical statements.
Qualification and Verification of Metaphorical Statements		
Step II: Derivation of Narratives		
Teachers select the most representative statement from their own set of metaphorical statements.	"Choose one metaphorical statement which is most representative of your teaching with computer technology and please explain in a few words."	Audio recording and verbatim verbal transcript of participants' explanations of their most representative metaphorical statement.
Step III: Metaphors for "The teacher as …"		
Derivation of metaphors for "The teacher as …" from teachers' own narratives.	"Please read the narrative for your representative metaphorical statement at least three times. Can you now complete the phrase 'The teacher as …'."	Audio recording and verbatim verbal transcript of teachers' responses.

Analysis of the Data

Data collection generated three sets of results: personally constructed metaphorical statements; narratives of teachers' most representative metaphorical statements for teaching with computer technology; and "The teacher as …" metaphors. The metaphors for "The teacher as …" were used to derive corresponding images and associated images depicted in the narratives for each teacher respectively.

Findings

From the analysis of the data the teachers' images of teaching with computer technology were derived. Consideration of the participants' metaphorical statements (Table 2) and their metaphors (Table 3) revealed connections that suggest conceptual coherence among the metaphorical statements, the narratives, and "The teacher as …" metaphors.

Table 2. Teachers' Most Representative Metaphorical Statements for Their Teaching Process with Computer Technology

Sundari
Computer technology is a tool I use to anchor my students so that they are focused.
Anthony
To teach or learn with computers is like learning to drive a car. Once the basics are mastered, driving is easy. Like driving it can break down and cause frustrations.
Ning
Computer technology is one of the tools in my toolbox that can help the students make meaning of what they are learning.
Angela
Computer technology to teaching is like seasoning to cooking. Appropriate quantity added at an appropriate time makes the dish taste better.
Tan
Computer technology in my teaching is like a bank. A lot of wealth is stored there. Pupils withdraw from it.
Woo
The teacher gives the skeleton and the students use computer technology to build up the meat of the skeleton.

Table 3. "The teacher as ..." Metaphors

Participants	Metaphors for "The teacher as ..."
Sundari	Captain
Anthony	Artist
Ning	Director
Angela	Cook
Tan	Director
Woo	Head Chef

Discussion

All the teachers who participated in this study communicated their images of teaching actions with computer technology integration through their metaphors (metaphorical statements and "The teacher as ..." metaphors) and accompanying narratives. The narratives served to unravel the conceptual mappings (Lakoff, 1994) that metaphorical statements and the "The teacher as ..." metaphors had encapsulated. The corresponding and associated images depicted in the narratives together with the metaphors (metaphorical statements and "The teacher as ..." metaphors) revealed how psychological insights were related to pedagogical actions (Salomon, 1998).

The teachers' metaphorical statements basically depicted teaching actions with computer technology as a tool with a purpose, "a tool I use to anchor" and "to build up," or as a tool itself that had a function or served to perform a function, "a car," "bank," and "one of the tools in my toolbox." The corresponding and associated images in the narratives further embellished the characteristics of the tool image together with the teaching images present in the narratives. For example, Sundari's image of teaching using computer technology involved images of an "anchor" in the "sand." Sundari's role in relation to the learning process with computer technology was to focus students onto the knowledge using the computer technology. The computer technology was the source of the knowledge—"it is like the anchor on a ship. It is deeply rooted in the sand"—to be transferred to the students. The captain metaphor revealed the image of a teacher in control of students' learning with the aid of computer technology. In the context of teaching with computer technology, it was possible that Sundari perceived the teacher as controlling the learning process of students by stabilizing the process with the computer technology, like a captain stabilizing a ship with an anchor. This results in students being focused on the content to be learned.

Encapsulated in the rest of the teachers' "The teacher as ..." metaphors and metaphorical statements were also corresponding and associated images as revealed by the narratives. The artist metaphor depicted Anthony's image of teaching with computer technology as being centered on the mastering of the computer technology for teaching, just like mastering the skills to drive a car. The director metaphor captured Ning's image of a teacher directing students in the use of computer technology for their own personal learning outcomes. The cook metaphor captured the image of Angela as a teacher who put much effort in to the integration of computer technology, with consideration given to the choice of software/hardware and timing, to make the teaching process effective.

The director metaphor encapsulated Tan's image of teaching with computer technology as a teacher directing students to use the computer technology like a "bank." Students were to "draw" content from the computer technology. The head chef metaphor encapsulated Woo's image of teaching with computer technology as a teacher needing to be in complete charge of the teaching process so that students will gain better content knowledge or even more content knowledge.

Conclusion

In this paper, the focus was to describe how teachers' images could help to increase the understanding of teachers' construction of meaning in teaching with computer technology integration. The empirical findings of this study have allowed the building of a relationship between the psychological insights, as captured and encapsulated by metaphors, and that of the narratives, which depicted the pedagogical actions. The findings further imply that teachers construct mental images to view and understand their thoughts and actions (Briscoe, 1991). The computer technology integration, in this study, was structuring and influencing the teachers' understanding leading to utilization of how teaching and learning were taking place. The study further reflects on how teachers operationalize teaching actions with images of themselves, the computer technology, their students, and the learning process. To help teachers utilize computer technology in their teaching there is a need for teacher educators during preservice and inservice courses to examine teachers' images. The findings here present a plausible reference to teachers' construction of meaning with the integration of computer technology in to teaching actions.

Implications

Teacher educators taking part in inservice and preservice courses involving the integration of computer technology in to pedagogy should give early attention to the images that teachers' thought structures encompass.

Inservice computer technology trainers have to look closely at their teaching approaches to accommodate the images that teachers already have of teaching with computer technology. Inservice computer technology trainers should embrace these underlying images to bring about effective ways to prepare teachers in their use of computer technology for pedagogical purposes.

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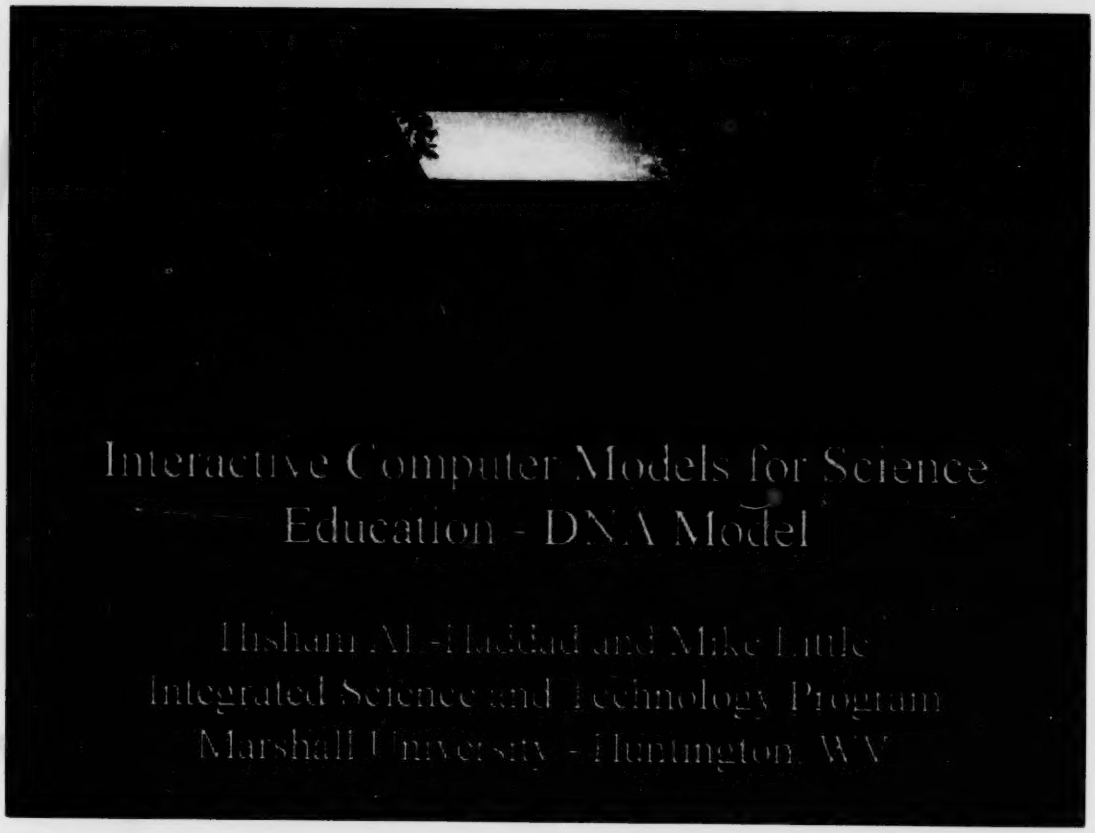

Interactive Computer Models for Science Education - DNA Model

Hisham Al-Haddad and Mike Little
Integrated Science and Technology Program
Marshall University - Huntington, WV

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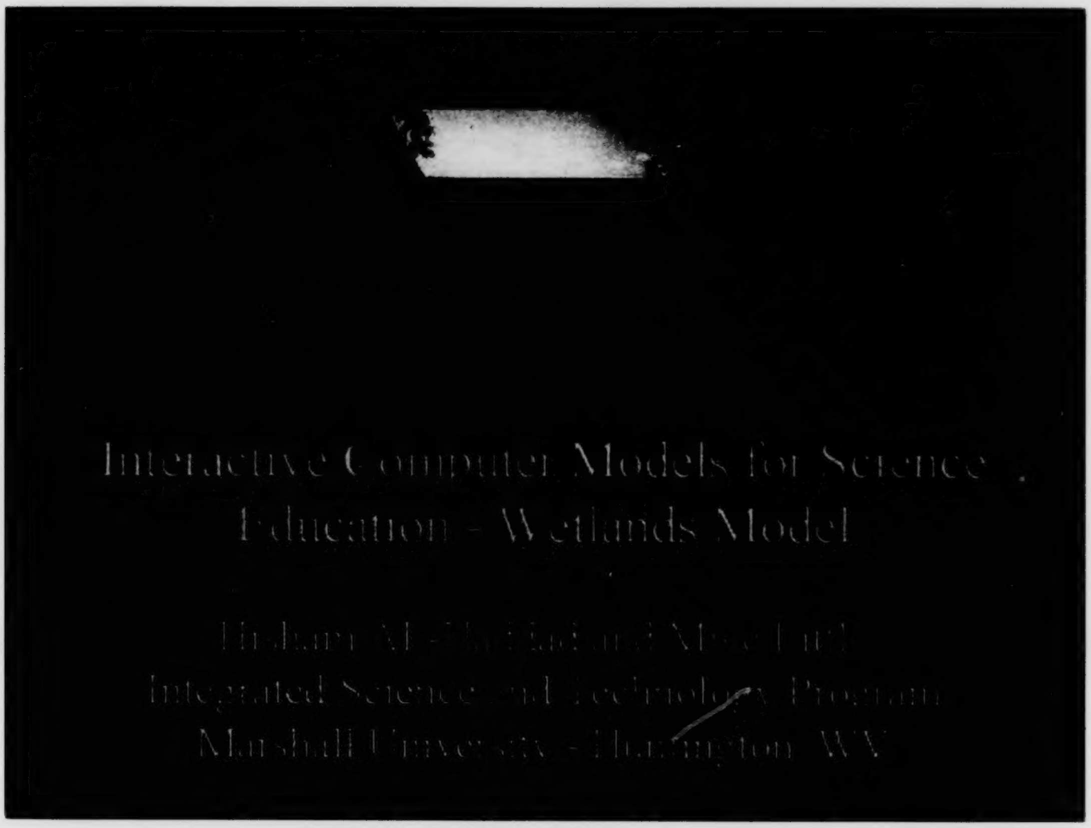

Interactive Computer Models for Science Education - Wetlands Model

Hisham Al-Haddad and Mike Little

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KATY
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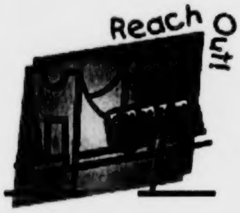
Learning Pathways

Learning Pathways (www.katy.isd.tenet.edu/pathways) is a Web site created as a resource for teachers, students, curriculum specialists, instructional technologists, and parents.

Learning Pathways Menu

Reach Out! | Featured Classroom | Timely Topics | Learner's Corner
Search For More | Teacher Topics | Classroom Connections | Tech Talk

Each of these resources provides extraordinary opportunities to connect with people and places around the world and allows you to add a divergence of ideas and perspectives to your topic of study. Based on research of the International Society for Technology in Education (ISTE) and the Milken Exchange on Education Technology (1999), it's not enough to merely have the hardware available, teachers need training, continuous support, and modeling of best practices for them to successfully integrate the available technology with their curriculum. Learning Pathways is our district's model of how to do this.



In the **Reach Out!** section (www.katy.isd.tenet.edu/pathways/reach.htm) you will find three types of resources: (1) online projects, (2) subject matter experts, and (3) virtual field trips. Online projects provide opportunities for students and teachers to connect with other classrooms around the world for curriculum-based projects. Subject matter experts provide expertise for a given field and can serve as mentors to students as they study certain topics. Virtual field trips enable students to travel "virtually" with a group of people exploring different parts of the world and then electronically share what they find.

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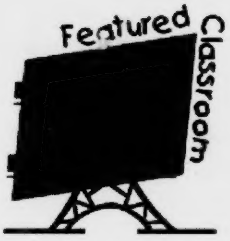

In the **Featured Classroom** section (www.katy.isd.tenet.edu/pathways/feature.htm), Katy ISD highlights its commitment to providing the best education to all students through a balanced, dynamic curriculum. Technology plays an important role in delivering that curriculum. Find out how technology is being integrated into teaching and learning in Katy ISD in this section of the site.

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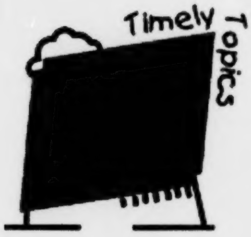

In the **Timely Topics** section (www.katy.isd.tenet.edu/pathways/timely.htm) you will find activities and links to sites on topics being studied throughout the school year in various curriculum areas. It is through the coordinated efforts of the Katy ISD Instructional Technology Department, instructional specialists, teachers, and the district Webmaster that these resources are made available here.

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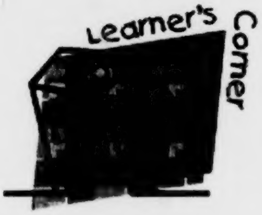

The **Learner's Corner** section (www.katy.isd.tenet.edu/pathways/learner.htm) is where you will find special resources for elementary and secondary learners, in addition to the homework help sites. Included in this section are sites on the Web that provide interactivity going beyond just providing information on a given subject. You can explore and respond to information you find on these sites in an interactive way.

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The **Search for More** section (www.katy.isd.tenet.edu/pathways/search.htm) contains a list of educationally based search tools to use for keyword searches. Search tips and a search tutorial are provided here.

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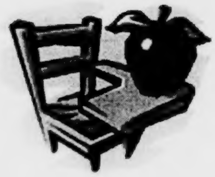

The **Teacher Topics** section (www.katy.isd.tenet.edu/pathways/tchertop.htm) provides links to organized indices of sites for teachers, professional resources/organizations, lesson plans, research, reference, quiz tools, Internet, and Webmaster resources.

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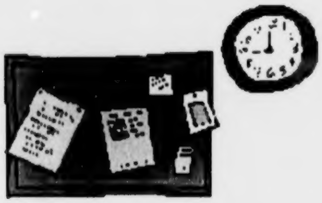

The **Classroom Connections** section (www.katy.isd.tenet.edu/pathways/connections) provides parents and students with information about such things as upcoming field trips, supply lists, major projects, and useful Internet resources for the classroom. These pages are created and maintained by the classroom teacher, grade level, or department.

TOP

Tech Talk

The **Tech Talk** section (www.katy.isd.tenet.edu/pathways/techtalk) features the Katy ISD Instructional Technology Department's newsletter. Highlights include articles about the use of technology in Katy ISD schools, technology tips, and curriculum resources.

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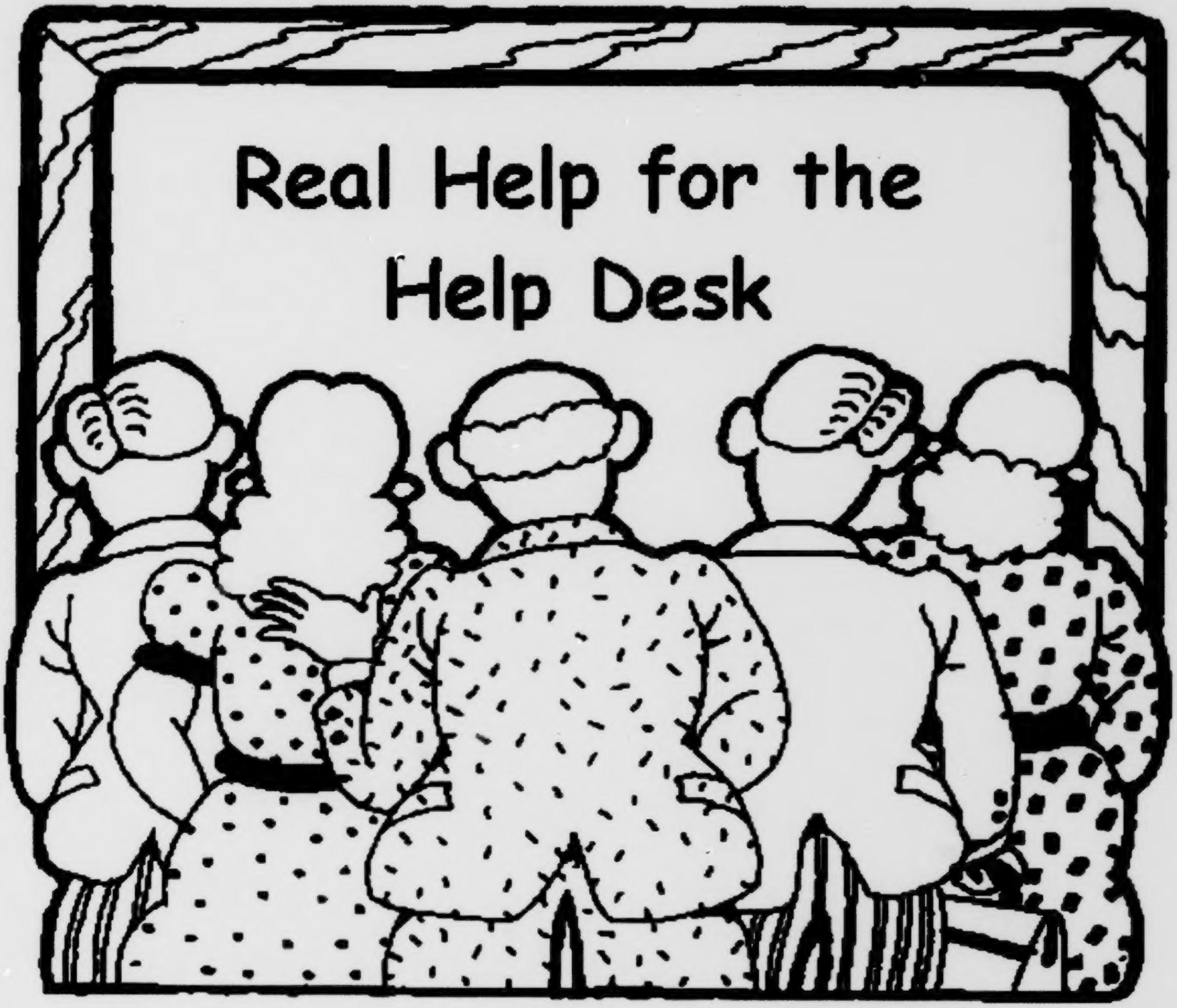

Real Help for the Help Desk

Students In Charge

Presented by

Barbara Barr

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Charlanne Pook, DTC
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National Educational Computing Conference
June 2000

Real Help for the Help Desk

Students in Charge

Opportunities For All Ages

Activities in which our students participate:

- **Infrastructure**
- **Technological**
  - Preventative Maintenance
  - Trouble Shooting
  - Repairs
  - Phone Support
- **KTLN/CenterNet**
- **Special Projects**
  - Authentic involvement

Training
- Manuals
- In-Service
- Just In Time Training

Planning and Organization
- Planning Meetings
- Meet with vendors
- Make arrangements
- Office assistance

Real Help for the Help Desk

Students in Charge

Opportunities For All Ages

- **Special Education Classes**
- **Special Needs**
- **Gifted Leadership Program**
- **Self Image Needs**
- **Belonging Needs**

- **Fast Workers**
- **Beta Club/Honor Society**
- **Organizations**
- **Philanthropic Groups**
- **Capstone Students**
- **For Credit**
- **Income Needs**
- **Real World Job Experience**

Real Help for the Help Desk

Students in Charge

Structuring the Programs

- **Begin with the end in mind!**
- **Planning**
- **Rules/guidelines**
- **System of checks and balances**
- **Flexibility**
- **Building process**
- **Student Handbook**
  - **General Information**
  - **Responsibilities**
  - **Day to Day**
  - **Contacts**
  - **Purchasing**
  - **Personal Growth**
  - **Technical Procedures**

Jessamine County Schools
District Technology Office
Hiring Procedures

- Student employees must be recommended by a teacher or staff member.
- Student must be a member in good standing with their school STLP.
- Students must fill out an application.
- Student must get 2 letters of recommendation.
- Student must submit application, resume, and letters of recommendations to the District Technology Office.
- Student must schedule an interview.
- Student must attend orientation training.

You are the communication link
between the
District Technology Office
and the school !

Jessamine County
District Technology Office
Expectations of Student Workers

- Keep a weekly time sheet
- Check email daily as most information is relayed this way.
- Adhere to school dress code

- Be pleasant to co-workers and visitors to the District Technology Office
- Keep a portfolio of their work
- Clean up after themselves
- Attend training sessions
- Call if unable to work at a scheduled time
- Always be courteous and professional in each work environment

Jessamine County Schools
District Technology Office
Student Work Procedures

Procedure Upon Arrival at Work:

- Check in with the Help Desk Coordinator
- Check work folder for the specific school where you will be working that day
- Look over Help Desk Tickets to make sure you understand the specific problems to be addressed.
- Check with MAC or PC technician to explain what you would do to solve each Help Desk ticket.

Work Procedures:

- When you arrive at the school, remember to check in with the STC/TRT.
- Introduce yourself to the teacher/staff in the room/office where you are working.
- Be willing to call from individual schools to receive additional technical support for problems.
- Upon completion of the work assignment, explain to the teacher/staff what was done.
- If the problem cannot be resolved, explain the next step or action.
- **Clean up after yourself and put things back!**
- Before proceeding to the next Help Desk Ticket, write a detailed explanation of the steps taken to resolve the problem.
- Upon returning to the District Technology Office, report each specific problem you worked on or the specific steps which need to be taken to complete the job.

Embedded Secure Document

The file *file:///F|/PRESENTS/barrett/barrett.pdf* is a secure document that has been embedded in this document. Double click the pushpin to view barrett.pdf.

Click to open author's original document.

Creative Use of Cyberspace: Training Teachers for Inclusion

Paper Presented at the National Education Computing Conference

Robin S. Barton, EdD
Mikki Garcia, EdD
Kim Simshauser

June 2000

We believe that infusing technology in courses increases faculty and student creativity and experiential learning by breaking down the barriers of traditional instruction and building learning communities. Doing so can be especially effective for future or current general education teachers learning how and expected to include students with disabilities in classroom experiences of all kinds. Therefore, we redesigned the required course, "Teaching and the Exceptional Child" that introduces future general educators to strategies for teaching students with disabilities in general education classrooms.

Our collaboration began four years ago as an effort to save time and to use our complementary skills and knowledge. As part of an accreditation process, we developed a generic syllabus for faculty who teach this course, that included (a) a choice of textbooks, (b) the catalog and course description, (c) course goals, outcomes and objectives, (d) suggested activities and assignments, and (e) a bibliography. As faculty often do, we then found ourselves with too little time and too much to do, so we divided our course preparation to make best use of our talents. Dr. Garcia wrote lecture notes and study guides while Dr. Barton developed the related slide presentations and assembled supporting materials (e.g., relevant articles, videos, and activities, required special education forms). When the opportunity to develop a WebCT course occurred, we took advantage of it. With the assistance of our instructional technology support specialist, Kim Simshauser, we transformed the slide presentations, study guides and related materials into instructional modules. And so it grew and continues to grow.

At Armstrong Atlantic State University (AASU), "Teaching and the Exceptional Child" fulfills the Georgia Professional Standards Commission requirement for initial teacher certification. Students include both undergraduates and persons seeking Georgia teacher certification, many of who move here from states where this course is not required.

"Teaching and the Exceptional Child" prepares teachers to teach students with disabilities in general education classrooms. The course includes twelve academically rigorous course modules with (a) online narrated slide lectures, (b) video clips of interviews with parents, teachers and students with disabilities, (c) text-based study guides, (d) links to content-related web sites, (e) links to definitive articles from professional journals and other sources, (f) access to the AASU library's electronic reserve system, and (g) interviews with special educators, special education faculty and specialists in the various disciplines.

The assignments for each module include chapter readings with focus questions and case studies that require comprehension, analysis, synthesis and evaluation of required readings. Activities require students to reflect on readings and integrate their learning with their prior knowledge and evaluate it from the perspective of future general education teachers. For example, in Module Five, students post responses to the following: "In the LD Forum on the course bulletin board, begin a dialogue with your classmates about the questions, ideas, or concerns that you have about teaching students with learning disabilities and/or attention deficit disorder in your class. Be age and subject specific, especially if you teach or plan to teach middle or secondary students. What would help you be more effective?" Another activity requires students to read articles from professional journals, to summarize the article (not just repeat the abstract!) and state how what they learned may help them as general educators.

The students who select the web-enhanced or online sections of the course often do so because they are nontraditional students, many with full time jobs, who like the flexibility of online learning. The syllabus, the course calendar and assignments clearly describe the minimal levels of student participation. For satisfactory completion of the course, students must accumulate enough points to earn a grade of C, the minimum that the AASU College of Education accepts for credit toward degree completion. Students earn up to 20 points for each of the twelve learning module completed. Required course activities include two projects, an annotated bibliography, four tests, and a group online presentation.

As we designed the course, we carefully examined the knowledge base and the learning processes required to meet the course objectives. We choose each activity for its contribution to the accomplishment of course objectives. Then we choose the appropriate technology for accomplishing the task. For example, to account for the varying learning styles of students, we provided opportunities for both text-based and experiential learning activities. Students may access the knowledge base either through reading or by listening to online narrated slide lectures. Many activities also involve posting answers to critical thinking questions on the course bulletin board, and then reflecting on and discussing answers to these questions with classmates. Students may also access the publisher's companion website and online study guide.

Two examples of our use of technologies involve online research and student presentations. Students locate and evaluate web sites and use the University library's online electronic reserves and electronic database to locate articles for an annotated bibliography. The text includes 16 chapters only 12 of which are included in formal learning modules. For the other four chapters topics and those in the Appendix, we use the WebCT group assignment tool to randomly assign students to chapter groups. Then each group uses the bulletin board, chat room or other communication modalities to collaborate on an online presentation based on self-selection of salient material from their assigned readings. Their classmates then may use to learn that material for their chapter study.

The course also requires students to make appropriate and effective use of external resources. Narrated slide lectures for most modules provide foundation knowledge in the WebCT environment. In addition, the text chosen has a companion website and online learning guide. Students also must do either web-based research using the Georgia Peachnet's Galileo databases or real-time library research using ORCA. They may also access brief video clips from the publisher that support the text, audio interviews with other faculty, as well as virtual field trips to community sites. Additional interviews and virtual field trips are in the planning stage. Students interview general educators, special educators and persons with disabilities. Students also may attend optional seminars where may view and discuss videos, engage in case-based problem solving, or engage in lively discussions with invited guests.

A link to the WebCT 2.0 Student Tutorial is on the student's course home page. On the WebCT course Listing page is a link to AASU WebCT support. Students are not required to learn and use html. They are encouraged to use tools like Netscape Composer. Netscape is the AASU standard browser. Those who want to develop their web design skills can access the WebMonkey home page [http://hotwired.lycos.com/webmonkey/index.html] and to ZDNet's Internet Basics and Web Design site [http://www.zdnet.com/zdhelp/stories/main/0,5594,2236427-4,00.html]. This page can also be accessed from the course "First Things First" page.

At the beginning of the course, students receive a letter that sets the stage for their online learning experience. In order to confirm their registration, they send an email to the instructor where they introduce themselves and tell why they are brave enough to venture into online learning. Then they receive a welcome letter explains how to access AASU's WebCT site, the syllabus, and the "First Things First" page. The welcome email also includes their first assignment. Students are also forewarned of the need to have access to these tools: (a) MS Word or Corel WordPerfect (All assignments are written in APA format using one program or the other.), (b) email (Outlook or Netscape) with assignments sent as, (c) American Psychological Association IV citation guidelines, (d) electronic reserves at the AASU library, (e) MS PowerPoint (nothing fancy required, just the basics) for the group project, (f) virus detection software (All emails need to be scanned before sending.), and (g) a WWW search engine. If they do not have these resources at home, they may access them in one of the computer labs on campus.

Our experience has taught us that the face-to-face versions of the course, which we both previously taught, were less rigorous than the web-enhanced or fully online courses we now teach. Why? First, the face-to-face course required less self-evaluation and less concrete evidence of critical thinking than either the web-enhanced or the web-centric versions. The web-based activities encourage students to think more critically and to reflect more on their learning. Each learning module also requires extensive writing and independent self-directed learning. The students, therefore, rely on an instructor less and more on their own resources to read, research, evaluate and integrate information. Lastly, student behavior confirms our observation since they constantly complain about how much work they have to do and in the same breath, tell us how much they are learning.

Further evidence of rigor is the syllabus, which clearly reveals course objectives in compliance with the principles of the Georgia Professional Standards Commission, the Southern Association of Colleges and Schools, and the National Council for Accreditation of Teacher Education. AASU's College of Education is NCATE accredited. Minimal levels of student participation are clearly stated in the syllabus in course outcomes, in student assignments and in student responsibilities. Course rigor also derives from the learning activities, which require students to build a knowledge base and then employ critical thinking strategies. Thus, students are enticed by ready access to materials and by discovering interesting and informative web sites. They often complain about how much time they spend on a module because they get involved in investigating the resources provided.

Keeping abreast of the constantly evolving knowledge base as well as the regulatory and legal mandates of special education law, challenges instructors who desire to keep current in these areas and to focus on preparing their students well. Therefore, we also wanted to be able to adapt the course modules for various levels, e.g., teachers in the field needing certification and undergraduates with no teaching experience and less academic maturity. For these reasons, we developed adaptable, multipurpose instructional modules that could be used in various contexts: (a) as a web-centric university-level course, (b) as a web-enhanced, traditional classroom-based course, (c) as an independent study course, or (d) as web-centric or web-enhanced staff development for currently employed teachers. During the spring 2000 semester, we taught three sections of "Teaching and the Exceptional Child:" (a) a web-enhanced, 15-week course, (b) a web-enhanced 7-week course, and (c) a web-centric (fully online) 15-week course.

Wending our way through this complex process made us carefully examine the academic rigor of everything we included so that materials and activities would meet the needs of a wide range of students and provide the rigor to ensure quality learning. For example, in the 7-week class, where we know students lack the academic maturity for self-directed learning, we offer more face-to-face instruction while still requiring active participation in web-based learning. The 15-week web-enhanced course has a weekly seminar to discuss course content, view supplementary videos or hear guest speakers. Seminar attendance is not required for the web-centric course; however, the seminars are open to them as well.

An example of a non Web-based assignment with content robustness is one where students interview a person with a disability. The interview results in written report on what the person does during the course of a regular day. The students then reflect on (a) sources of stress observed, (b) evidence of the individual's attitude toward the disabling condition, (c) evidence of support from family, teachers and/or peers, (d) the extent of the individual's independence/dependence, and (e) the person's emotional, social, and educational well being. In addition, they summarize their personal reactions reporting what they learned and the impact of the experience on them. Our goal is not only to have students develop intellectually but also affectively by deepening their understanding of persons with disabilities.

Another content-robust, non Web-based assignment requires students to interview three teachers asking each three questions about their classroom management strategies. Then, after reading the text and/or listening to the lecture, they write a 1-2-page paper reflecting on the 5 classroom management strategies discussed by the teachers and by the text authors that they think might help them in their classrooms.

A content rich Web-based assignment asks them to examine cartoons of Calvin and Hobbes and then to visit the Calvin and Hobbes web site. Using what they learn from reading the chapter, they decide whether they believe Calvin is a gifted youngster and state the reasons for their decisions. Then to make matters more interesting, they report how they would manage Calvin's behavior as Calvin's father. This written assignment integrates understanding the humor of the delightful Calvin and Hobbes with knowledge of gifted youngsters and the parenting strategies their parents need.

On the CEUG2100 Tools Page is a link to UCLA Library's guidelines for evaluating web sites. Throughout the course, students are exposed to web sites that provide them with information that supports the content of course. One project assignment is to select five web sites and evaluate them using the guidelines provided. That process includes both the evaluation process and validation process. In another assignment they enter "attention deficit hyperactivity disorder" in a search engine of their choice and then evaluate the validity of the web sites against information in their text and other resources and explain the basis for their decisions about the validity.

Most students who have taken the course to date are nontraditional students who work and attend classes in the evenings. Although they have been offered the opportunity to use the course chat room, they have chosen not to do so because it is very difficult for them to find agreed-upon times to chat. Therefore, to date we have not used the chat room. However, we make extensive use of Email and the bulletin board. Students especially like the bulletin board because it allows them to reflect before responding and to read respond to other students' postings. Usually the lively dialog among the students requires little comment from the instructor, other than an enthusiastic one about the interest and complexity of the discussion. They use either external email or WebCT email to send assignments as attachments. The instructor usually interacts daily with various students by email or bulletin board postings and with groups of students by the bulletin board. . Each student receives personal emails discussing their work performance. Often the instructor uses the editing functions in Microsoft Word to insert comments as well. Students also have access to WebCT home pages. We have not discovered a course activity suitable for the whiteboard, but rest assured if we do, we would use it because the bulletin board has served us so well.

We believe that "Teaching and the Exceptional Child" has exemplary breadth and depth of content for an initial preparation, teacher-education course. Students interact with the content about exceptional learners, and with each other and the instructor, in complex and meaningful ways. Clearly, this course goes far beyond just the inclusion of a course syllabus and the instructor's lecture notes. We invested conscientious effort in building a learning community where students learn not only from the instructor and the learning modules but also from each other and from external sources. Both non web-based and web-based assignments are (a) clearly stated, (b) cause students to apply course concepts and skills and (c) require critical thinking. In addition, web-based assignments require students to evaluate and validate web-based information. They also clearly specify the student's required work products. The WebCT modules lead students through paths of information and activities in logically organized, manageable segments. Students interact with each and with the instructor often using asynchronous tools, such as the bulletin board and email. The instructor actively participates in the course, not only interacting with students but also constantly revising content and assignments to meet students' needs. Many students' web access is limited by slow download times; therefore, digitized images and graphics are used only when they add value to the learning process. Students' learning is assessed using the built-in WebCT quiz features as well as written activities that require reading, research and critical thinking. We both have come to realize the value added to a course by the judicious and appropriate use of the web learning environment. We believe our students value it as well.

Access is an important issue in web-based instruction, especially access for students with disabilities enrolled in the course. In creating this course, we produced alternative versions of the content to allow students with hearing and visual impairments to participate. All they need to do is to inform us of their needs and we will provide adapted content to accommodate them. We made transcripts of all audio lectures and videos and used tags to identify images for text reading software.

We believe that we are on the brink of an evolution in higher education. This evolution will open higher education to more people and allow each student to engage more actively in both designing and implementing his or her own course of study. We are excited to be part of a process that is changing the teaching-learning paradigm to one where students participate with us in a technology-enriched learning community.

7-12-99

Faculty Instructional Technology Skill Sets

Operating System Skills

	Beginning	Intermediate	Advanced
General Computer Skills	• Identify computer parts • Use and locate a printer • Navigate and select menu items	• Back up files to the server	• Remove viruses from a floppy disk and the hard drive
Operating System Skills	• Log on and navigate both platforms • Learn to use either Mac OS8 or Windows 95/98	• Begin a document on one platform and finish on the other • Rename files	• Convert files between platforms and file types • Learn how to use both Mac OS8 and Windows 95/98
Computer Troubleshooting	• Check electrical and peripheral connections • Check keyboard and mouse cables • Conduct a "forced quit" • Restart the computer after a system crash • Accurately report problems to the help desk	• Clear printer jams • Check status of printer with the print monitor	

Production Skills

Word Processing Skills	• Locate and open an existing document • Create an MS Word or ClarisWorks file • Understand and use tool bars • Cut, copy, insert and move text • Use grammar and spell check • Print files and adjust page setup as needed • Save files to multiple locations	• Change the formatting of a document • Create tables • Add graphics to a document • Use pre-existing templates • Save a .doc file as another file type	• Create a template • Set up and use mail merge • Integrate a spreadsheet or a chart
Database Software Skills • **Pentamation** • **FileMaker Pro** • **TreviAC**	• Search and retrieve data • Sort fields by specific data • Save the database file • Print a prepared report	• Enter and edit data in a pre-existing file • Add new fields to a database • Create new layouts • Create a new database file	• Define relationships between fields and files • Use calculations • Use summary fields • Set up and use mail merge

Spreadsheet Software Skills	• Open an Excel workbook • Enter and edit data in a pre-existing workbook • Save the workbook • Print a prepared report	• Insert, modify and delete rows and columns • Create or modify the layout • Create a range • Enter a formula • Sort data • Create a new worksheet • Create a chart	• Modify chart layout • Import and export information • Import and export data
Presentation Software	• Open a PowerPoint file • Create a new presentation in both slide and outline format • Present a prepared document	• Format a presentation using a template • Use transitions and builds • Print handouts	• Create user notes • Add graphics, charts and multimedia

Internet Skills

Web Skills	• Launch Netscape • Use hyperlinks • Find a specific web site by typing in the URL • Use basic search engine skills to find information • Use bookmarks	• Use bookmarks • Download files from the Internet	• Use advanced search engine skills to find information • Organize, import and export bookmarks
Email Skills	• Send and receive email • Open an attachment	• Enter setting information • Send attachments • Utilize features like forward and reply • Set up signature files	• Utilize address book and create distribution lists • Create alternate mail folders and use filters • Subscribe to and participate in listserv discussion groups

Miscellaneous Skills

Voice Mail Skills	• Retrieve messages • Send messages • Record a greeting	• Record an extended absence greeting • Use advanced features such as forwarding and group distribution lists	

Audio-Visual Skills	• Be able to operate the following:
	  • VCR
	  • Overhead projector
	  • Photo copier
		• Be able to operate the following:
		  • Classroom network hookups
		  • Laserdisc player
		  • CD player
		  • Video projector
		  • Fax machine
		• Connect a laptop computer to the video system
			• Be able to operate the following:
			  • Equipment in the EPI center

2-9-99

Faculty Instructional Technology Skill Sets

Operating System Skills

	Beginning	Intermediate	Advanced
General Computer Skills	• Identify computer parts • Use and locate a printer • Navigate and select menu items	• Back up files to the server	• Remove viruses from a floppy disk and the hard drive
Operating System Skills	• Log on and navigate both platforms • Learn to use either Mac OS8 or Windows 95/98	• Begin a document on one platform and finish on the other • Rename files	• Convert files between platforms and file types • Learn how to use both Mac OS8 and Windows 95/98
Computer Troubleshooting	• Check electrical and peripheral connections • Check keyboard and mouse cables • Conduct a "forced quit" • Restart the computer after a system crash • Accurately report problems to the help desk	• Clear printer jams • Check status of printer with the print monitor	

Production Skills

Word Processing Skills	• Locate and open an existing document • Create an MS Word or ClarisWorks file • Understand and use tool bars • Cut, copy, insert and move text • Use grammar and spell check • Print files and adjust page setup as needed • Save files to multiple locations	• Change the formatting of a document • Create tables • Add graphics to a document • Use pre-existing templates • Save a .doc file as another file type	• Create a template • Set up and use mail merge • Integrate a spreadsheet or a chart
Database Software Skills • **Pentamation** • **FileMaker Pro** • **TreviAC**	• Search and retrieve data • Sort fields by specific data • Save the database file • Print a prepared report	• Enter and edit data in a pre-existing file • Add new fields to a database • Create new layouts • Create a new database file	• Define relationships between fields and files • Use calculations • Use summary fields • Set up and use mail merge

Spreadsheet Software Skills	• Open an Excel workbook • Enter and edit data in a pre-existing workbook • Save the workbook • Print a prepared report	• Insert, modify and delete rows and columns • Create or modify the layout • Create a range • Enter a formula • Sort data • Create a new worksheet • Create a chart	• Modify chart layout • Import and export information • Import and export data
Presentation Software	• Open a PowerPoint file • Create a new presentation in both slide and outline format • Present a prepared document	• Format a presentation using a template • Use transitions and builds • Print handouts	• Create user notes • Add graphics, charts and multimedia

Internet Skills

Web Skills	• Launch Netscape • Use hyperlinks • Find a specific web site by typing in the URL • Use basic search engine skills to find information • Use bookmarks	• Download files from the Internet	• Use advanced search engine skills to find information • Organize, import and export bookmarks
Email Skills	• Send and receive email • Open an attachment	• Enter setting information • Send attachments • Utilize features like forward and reply • Set up signature files	• Utilize address book and create distribution lists • Create alternate mail folders and use filters • Subscribe to and participate in listserv discussion groups

Miscellaneous Skills

Voice Mail Skills	• Retrieve messages • Send messages • Record a greeting	• Record an extended absence greeting • Use features such as forwarding and group distribution lists	

Audio-Visual Skills	• Be able to operate the following:
	  • VCR
	  • Overhead projector
	  • Photo copier
		• Be able to operate classroom video equipment (Black box)
		• Connect a laptop computer to the video system
			• Be able to operate EPI Center equipment

Optional Additional Skills

	Beginning	Intermediate	Advanced
HyperStudio	• Open and navigate through a stack • Understand the concepts of button, card, stack, text and home	• Create a new stack • Add cards to an existing stack • Add functional buttons • Add text and graphics (both paint and draw) objects • Transport a stack between platforms	• Add a sound to a stack • Add a video clip to a stack • Create an animation
Pentamation (Student records)	• Log into Pentamation & properly exit • Query a student's records • Print an individual screen	• Use the ring menu • Query multiple student records • Print a predefined report • Select a printer	• Use the FastPath option • Use Boolean operators to print a report with multiple criteria
MCL Lab Equipment	• Starting the system and identify parts of the teacher's position (ASC DI 8 Console) • Use and locate Master PC, VCR, LaserDisk and Vizcam • Knowledge of the operation software (The Main Screen, The Menu)	• Create, save and load a new class file • Enter and modify students' names to a class list • Create , save and load group files • Assign sources to program groups • Communicate with a single student, group of students or with a conference group • Use pairing, conference mode, and telephone mode • Monitor students and remote control over their recorders and computers • Select a student as a model voice • Load a program audio or video tape , CD, laser disc or CD-ROM	• Using a Response Analyzer • Use Audio program Editor • Use Test and Quick Test • Use Response Retrieval with Test • Fast erase tapes

Claris Home Page	• Working in a Claris Home Page document • Opening HTML files • Using Edit Page mode • Cutting, copying, and pasting • Using the toolbars and palettes • Using the object and link editors • Resizing elements using the mouse • Previewing your work • Using Preview Page mode and previewing your Web page in a browser	• Adding extra HTML to your page • Using Edit HTML Source mode • Changing the text display in Edit HTML Source mode • Adding attributes to an element • Adding images to your Web page • Adding HTML to text • Adding HTML to the document tags • Setting the color and background of your Web page • Using an image for the background • Printing your Web page • Using the Site Editor	• Adding text to your Web page • Adding tables to your Web page • Using Claris Home Page libraries • Creating links and anchors • Adding frames to your Web page • Adding forms to your Web page • Connecting to a FileMaker Pro database • Adding multimedia to your Web page

Internet Searching Classes

Class 1	Learn the different types of Internet search tools Learn tips and techniques for effective searching Learn to use AltaVista, Hot Bot or Excite	Prerequisites: None
Class 2	Use Boolean logic to refine a search	Prerequisites: Mastery of the Internet class 1 skills
Class 3	Learn to evaluate Internet web sites	Prerequisites: None
Class 4	Learn to use a meta-search engine: Metacrawler, Dogpile or Inquire Pro Use specialized search tools	Prerequisites: Mastery of the Internet Class 1 skills
Class 5	Learn to create, edit and organize your bookmarks	Prerequisites: Mastery of the Internet Class 1 and 2 skills
Class 6	Download files from the Internet Use and print Adobe Acrobat files	Prerequisites: Mastery of the Internet Class 1 and 2 skills
Class 7	Learn about Internet security and how to recognize a secure site Learn how to cite Internet sources	Prerequisites: Mastery of the Internet Class 1 and 2 skills

•Subject to review & change

Internet Searching

Class 4

New Trier High School

Staff Development

Training Guide

Prepared by

Instructional Technology Department

- For assistance, please call the Help Desk @ ext. 2624

Internet Searching – Class #4

Course Objectives:

1. Use a meta-search engine
2. Learn about specialized search tools

(go to http://nths.newtrier.k12.il.us/library/isearch/isearch4.htm)

What is a Meta-search Engine?

Meta-search engines pose your question to up to a dozen or more search engines and directories simultaneously. They can be efficient, but tend to be slower and not as precise as single search engines.

- **MetaCrawler**: Sends your keywords to ten different search tools, then collects and displays the best response from each (http://www.metacrawler.com)
- **Dogpile**: Searches the Web, newsgroups, stock quotes, ftp sites and others. (http://www.dogpile.com)
- **InquirePro**: Developed by the students at the Illinois Math and Science Academy, this meta-search engine searches AltaVista, Excite, Hotbot, Lycos and Yahoo. (http://toolkit.imsa.edu/search/).

Using InquirePro

inquirePro

InquirePro is a meta-search engine developed by the students at the Illinois Math and Science Academy. It will do the following:

- Save you time by searching multiple engines simultaneously and returning citations without the time-consuming downloading and distracting clutter of advertisements
- Give you access to multiple search strategies without the need to enter the detailed syntax required by individual search engines
- Enable you to control the ranking and organization of the results returned by individual search engines
- Identify sites that returned multiple citations so you can search them more thoroughly
- Automate in-depth searches of individual sites*

InquirePro searches AltaVista, Excite, HotBot, Lycos and Yahoo, offers multiple options and settings, and will allow you to limit your search to images or sounds. Its Internet Search Center offers great information on how to formulate searches, reviews of search engines, and a tutorial. Best of all, it has no advertising!

*From the IMSA Internet Search Center Home Page (http://toolkit.imsa.edu/)

Specialized Search Tools**

Specialty Search Engine

- **SearchPower** (http://www.searchpower.com): A search engine for specialized subjects

Graphics and Multimedia

Graphics and Multimedia

- **AltaVista** (http://www.altavista.com/): Click on Images, Video or Audio to restrict your search.
- **Beaucoup** (http://www.beaucoup.com/): Searches for art, music, sounds.
- **The Image Base** (http://www.thinker.org/imagebase/index-2.html) Searches the Fine Arts Museums of San Francisco.
- **Clip Art Searcher** (http://www.webplaces.com/search/): Use several different search engines to find graphics, sound and video files.
- **Electric Library** (from the NTHS Library home page): http://nths.nttc.org/library/home2.htm): Click on Pictures to search for graphics files.
- **MP3.com** (http://mp3.com/): All things about MP3, including thousands of legal MP3 files.
- **MP3meta** (http://www.mp3meta.com/): Search all the major MP3 search engines at once through this metasearch service from SavvySearch.

Newsgroup Searching

- **Supernews** (http://www.supernews.com/): Searches newsgroup discussions, with archives..

Mailing Lists

Looking for folks with similar interests? Join an Internet listserv. Some good places to start looking:

- **List of Lists**: (http://catalog.com/vivian/interest-group-search.html): Search for lists of interest.
- **Liszt** (http://www.liszt.com/: The granddaddy of listserv searching, still a good place to find subject listservs.
- **Publicly Accessible Mailing Lists (PAML)** (http://www.neosoft.com/internet/paml): One more good place to find mailing lists.

Internet Shopping

- **Dealpilot** (http://www.acses.com/): A buying service for books, CD's, videos and DVD's, which checks about 25 Internet stores to find the best price.
- **Buyer's Index** (http://www.buyersindex.com): Lists information from about 9,000 mail order companies, web shopping sites and classified ad sites.
- **mySimon** (http://www.mysimon.com): The largest comparison shopping service on the Internet; searches over 1500 merchants

Science Search Engines

- **Biocrawler** (http://www.biocrawler.com/): Directory and search engine for biological information.
- **Chemie.DE** (http://www.chemie.de/): Directory and search engine for information about chemistry. Click on the "search engine" link on the home page to search.
- **Biolinks** (http://www.biolinks.com/): A search engine for scientists, with links to journals, organizations, companies and more. It spiders the web and has human-categorized results.

Medical Search Engines

Medicine

- **MedHunt** (http://www.hon.ch/MedHunt/): MedHunt uses both humans and web crawling to build its index of medical information. Searches can be narrowed by region, and a French interface is available.
- **Citeline.com** (http://www.citeline.com/C1SE/search): Provides a focused medical search, using a pre-screened index of medical sites.
- **Medical World Search** (http://www.mwsearch.com/): Listings are created by spidering pages from a select group of medical sites, in order to keep results tightly focused.

Financial Searching

With the sites listed below, you enter the name of a company or a stock symbol, and then you'll be linked to a page with quotes, financial data and more.

- **DailyStocks** (http://www.dailystocks.com/)
- **JustQuotes.com** (http://www.justquotes.com/)
- **TradingDay** (http:tradingday.com/)

Law

- **Oyez, Oyez, Oyez** (http://oyez.nwu.edu/): U.S. Supreme Court multi-media database sponsored by Northwestern University.
- **FindLaw** (http://www.findlaw.com/): Directory of legal web sites.
- **LawCrawler** (http://www.lawcrawler.com/): Powered by an AltaVista search engine, delivers information only from sites identified as dealing with law issues.

Web Rings

Web rings are groups of sites linked together around a similar topic. Each would install a special code on its pages, making it easy to connect to the next site in the ring. You can search the rings for particular areas of interest.

- **Bomis** (http://www.bomis.com/)
- **WebRing** (http://www.webring.org/)

Search Problems

Try searching for some of the following problems using both the meta-search engines and the specialized ones.

- Find a web ring of Internet sites about Australian history.

- A few years ago, the Reverend Jerry Falwell sued *Hustler* magazine for libel, claiming that he had been defamed by a story the magazine had run. He received damages, but *Hustler* appealed. Find the Supreme Court case which dealt with this problem. What was the verdict of the court?

- Cystic fibrosis has long been a difficult disease to manage for young patients. Find some information about the new treatments for cystic fibrosis which use so-called "orphan" drugs.

- Where can you buy women's cotton sweaters online?

- You are preparing a web site for a mythology project your students are working on. Find a picture of Achilles which you can use on this page.

- Bluegrass is one of your favorite types of music. Find a listserv devoted to bluegrass.

**Much of the information in this section came from Search Engine Watch, an extraordinarily useful site for anyone who does it a lot of Internet searching. It can be accessed at http://www.searchenginewatch.com

Internet Searching

Class 5

New Trier High School

Staff Development

Training Guide

Prepared by

The Library Staff

- **For assistance, please call the Help Desk @ ext. 2624**

Internet Searching: Class 5

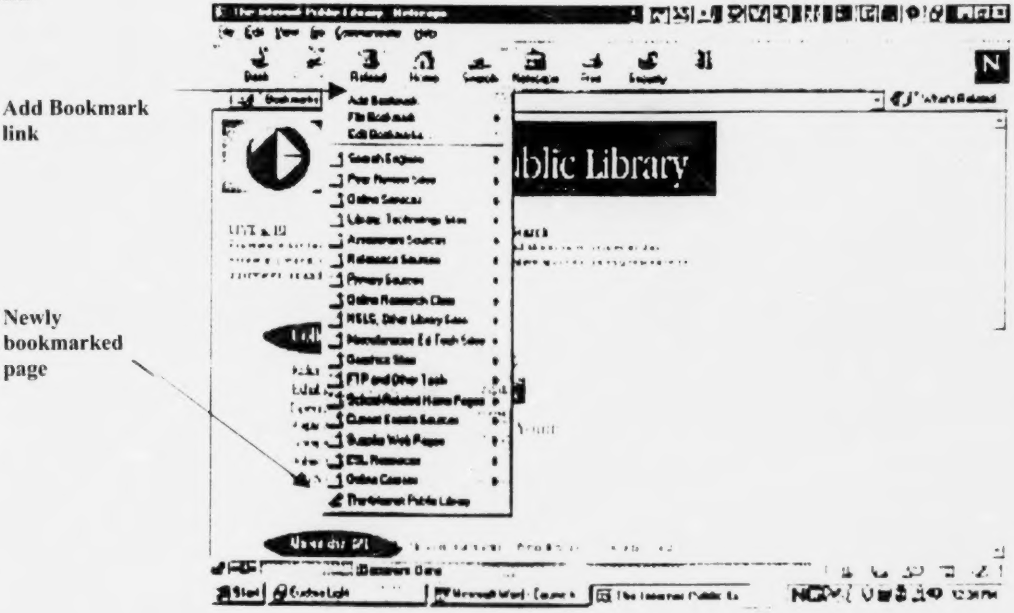
Course Objectives:

1. Learn to create a book mark
2. Learn how to edit and organize bookmarks
3. Learn how to create and use multiple bookmark lists
4. Learn how to check the currency of your bookmarks

Creating a Bookmark

To book mark a web page:

- Go to the web page you want to bookmark.
- Click **Bookmarks**.
- Choose **Add Bookmark**
- The name of the currently displayed page is added as the last item in the Bookmark menu.


Add Bookmark link
Newly bookmarked page
Reload
Home
Search
Print
Security
N
Add Bookmark
File Bookmark
Edit Bookmarks...
Search Engines
Reference Sources
Primary Sources
Online Research Class
FTP and Other Tools
School-Related Home Pages
Current Events Sources
ESL Resources
Online Courses
The Internet Public Library
ublic Library
Document: Done
Start

To revisit a bookmarked web page:

- Click **Bookmarks**.
- Choose a bookmarked page.

Editing and Organizing Bookmarks

To organize your bookmarks into folders:

- Click **Bookmarks** and choose **Edit Bookmarks.**
- Click the item just above where you want to put a new folder
- Open the **File** menu and choose **New Folder**.
- Give your new folder a name and click OK
- Drag your bookmark into it.

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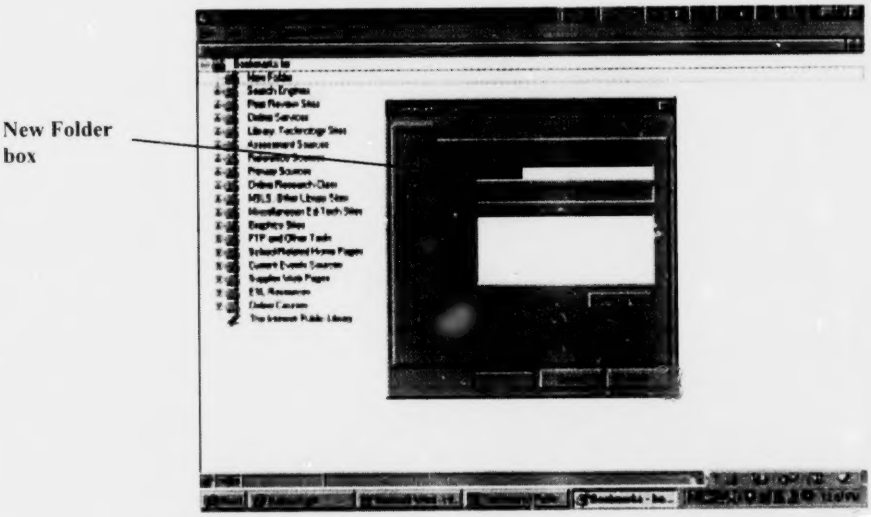

To reorder bookmarks:

- Click **Bookmarks** and choose **Edit Bookmarks**
- Drag any bookmark, folder, or separator to reposition it

To delete a bookmark:

- Click **Bookmarks** and choose **Edit Bookmarks.**
- Click to select a bookmark
- Press the **Delete** key

To file a bookmark on the fly:

- Go to the web page you wish to bookmark
- Click **Bookmarks** and choose **File Bookmark**
- Choose a folder in which to store a bookmark for the current page

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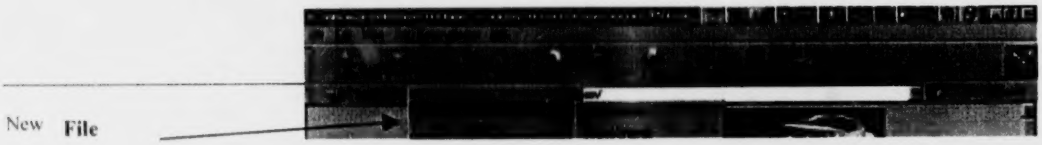
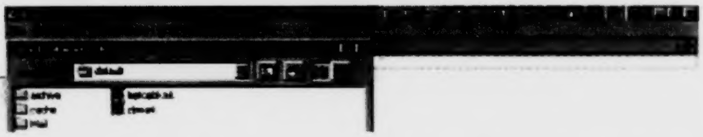


Keeping Multiple Bookmark Lists

You can have more than one bookmark list, each with its own set of titles linked to favorite pages. Only one bookmark list can be active at a time.

To save a bookmark list:

- Click **Bookmarks** and choose **Edit Bookmarks.**
- Open the **File** menu and choose **Save As.**
- Give the file a name
- The list is saved as an HTML-formatted file



New Tri

Saved Bookmark file

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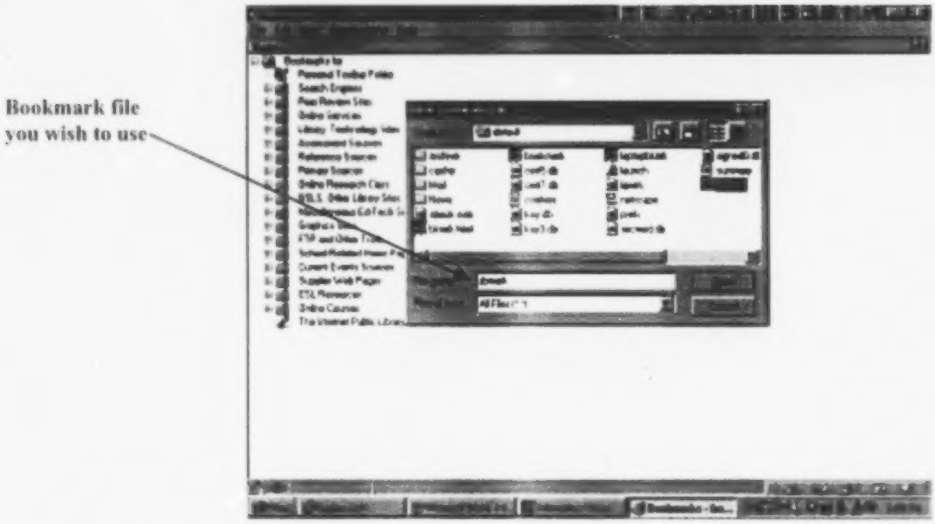
To open and use a bookmark list:

- Click **Bookmarks** and choose **Edit Bookmarks.**
- Open the **File** menu and choose **Open Bookmarks file**.
- The file you open determines what you see in the **Bookmarks** menu.



Checking the Currency of Your Bookmarks

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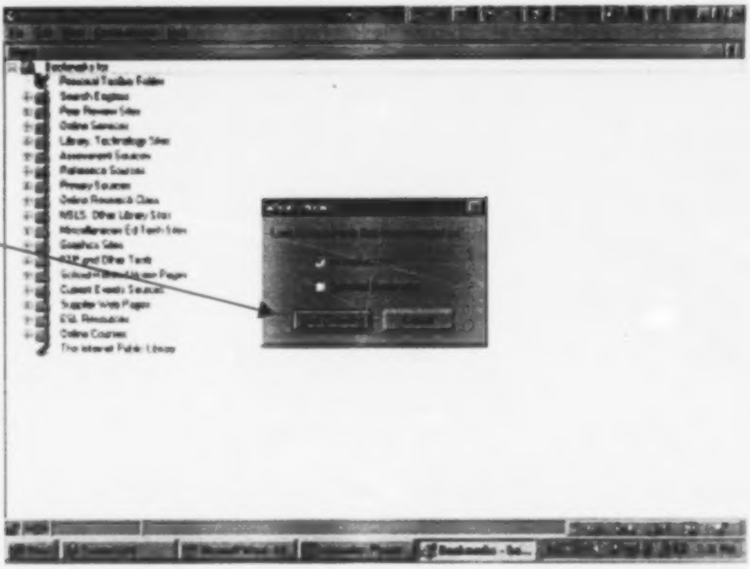
To find out if a bookmarked page has been moved or modified since your last viewing:

- Click **Bookmarks** and choose **Edit Bookmarks**.
- Select one or more bookmarks. If you want to check all bookmarks, don't select any.
- Open the **View** menu and choose **Update Bookmarks.**
- Click **All Bookmarks** or **Selected Bookmarks.**
- Click **Start Checking.**



Start Checking button

If a page has changed, Netscape puts a special mark on the page's bookmark icon. If Netscape is unable to verify a page, it puts a question mark on the page's icon.

To change information for any current bookmark or bookmark folder:

Click **Bookmarks** and choose **Edit Bookmarks**.
Select a bookmark or bookmark folder.
From the **Edit** menu, choose **Bookmark Properties**.
To make a change, type in a new name or URL. (The URL field is dimmed if a folder is selected.
Choose **OK.**

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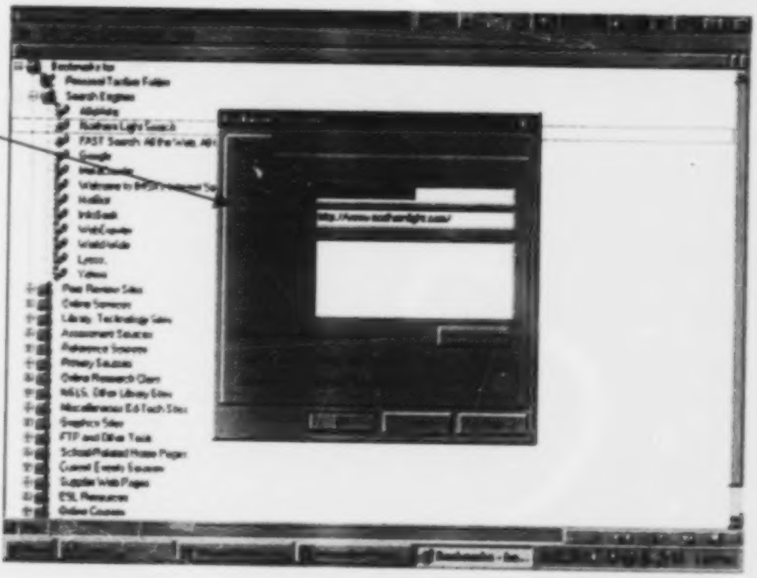

Type in new name or new URL

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Overview of the Individual Technology Learning Plan

In the past, New Trier has offered a variety of incentives for staff development in technology. Staff computer purchases have been an ongoing program. The most recent purchase with a training option resulted in more than sixty staff members taking advantage of the program. New Trier has provided free standard software for the staff. Several teachers have been given technology-based projects of excellence. In the past, staff members were paid to attend summer training courses. There was not necessarily a well-organized flow to the courses taken nor was anyone specifically assigned to help a staff member determine his/her needs and shepherd him/her through the process.

The goal of the Individual Technology Learning Plan (ITLP) program developed will be to assist the staff member in reaching a higher level of technology skill as appropriate for his/her position at New Trier. The development of an individual technology learning plan for a staff member would improve the overall technology staff development program at New Trier. It will allow us to work with staff members in a more formal way and allow us to more readily assess training needs among the staff as well.

ITLPs will be developed based on the faculty or support staff technology expectations developed by the Greater Technology Committee. The goal of the ITLP would be to assist the staff member in mastering additional skills that will help them in his/her position. In addition to the ITLP, the process will also have teachers complete a classroom technology survey to assess current level of technology integration in the classroom. This same survey will be completed at the end of the ITLP process to be able to document technology growth directly related to student learning.

After a staff member volunteers to work on an ITLP, they will meet with a member of the technology staff to assess current skills against the skill expectations. They would then work with that consultant to review the self-assessment and build a technology learning plan that would best meet his/her individual and departmental needs. The ITLP will count towards satisfying the new staff development requirements for teaching certificate renewal.

The staff member would then participate in staff development courses, self-guided instruction or any other staff development opportunities that would help them complete his/her plan. Throughout the process, the consultant would work with the teacher to ensure that the staff development was appropriate and that the process was moving along smoothly. All ITLPs created would have a practical component to ensure that the staff member understood how to utilize the technology skills within his/her position. The average ITLP would most likely take approximately 30 hours of work to complete. ITLPs will be developed to be completed over either one or two years.

When the training is completed, the staff member would work with the consultant to assess the success of the plan and the effectiveness of the staff member's new skills. When the participant has demonstrated successful completion of the ITLP, the IT consultant would recommend the staff member receive an appropriate stipend for completion. Stipends will range between $1000 and $2000 depending upon the amount of skill development.

After the initial completion of an ITLP, the staff member will be encouraged to continue to improve his/her skills through the staff development opportunities available through New Trier. In addition, some of those who complete an ITLP may desire to serve as trainers or consultants in the future. As technology advances and the New Trier skill expectations evolve, those who had already obtained skills from an earlier ITLP would be given modest incentives to upgrade their skills to the new level.

For more information or to volunteer to participate please contact Laura Bizar x2701.

Technology Skill Assessment for Jane Q. Trevian

All of the skills that the assessment shows you have are grayed out on the form below. You appear to have most of the skills at the beginning level. This would suggest a plan to obtain the advanced skills.

Operating System Skills

	Beginning	Intermediate	Advanced
General Computer Skills	- Identify computer parts - Use and locate a printer - Navigate and select menu items	- Back up files to the server	- Remove viruses from a floppy disk and the hard drive
Operating System Skills	- Log on and navigate both platforms - Learn to use either Mac OS8 or Windows 95/98	- Begin a document on one platform and finish on the other - Rename files	- Convert files between platforms and file types - Learn how to use both Mac OS8 and Windows 95/98
Computer Troubleshooting	- Check electrical and peripheral connections - Check keyboard and mouse cables - Conduct a "forced quit" - Restart the computer after a system crash - Accurately report problems to the help desk	- Clear printer jams - Check status of printer with the print monitor	

Sample

Production Skills

Word Processing Skills	- Locate and open an existing document - Create an MS Word or ClarisWorks file - Understand and use tool bars - Cut, copy, insert and move text - Use grammar and spell check - Print files and adjust page setup as needed - Save files to multiple locations	- Change the formatting of a document - Create tables - Add graphics to a document - Use pre-existing templates - Save a .doc file as another file type	- Create a template - Set up and use mail merge - Integrate a spreadsheet or a chart
Database Software Skills - **Pentamation** - **FileMaker Pro** - **TreviAC**	- Search and retrieve data - Sort fields by specific data - Save the database file - Print a prepared report	- Enter and edit data in a pre-existing file - Add new fields to a database - Create new layouts - Create a new database file	- Define relationships between fields and files - Use calculations - Use summary and subsummary type fields - Set up and use mail merge

Spreadsheet Software Skills	• Open an Excel workbook • Enter and edit data in a pre-existing workbook • Save the workbook • Print a prepared report	• Insert, modify and delete rows and columns • Create or modify the layout • Create a range • Enter a formula • Sort data • Create a new worksheet • Create a chart	• Modify chart layout • Import and export information • Import and export data
Presentation Software	• Open a PowerPoint file • Create a new presentation in both slide and outline format • Present a prepared document	• Format a presentation using a template • Use transitions and builds • Print handouts	• Create user notes • Add graphics, charts and multimedia

Internet Skills

Web Skills	• Launch Netscape • Use hyperlinks • Find a specific web site by typing in the URL • Use basic search engine skills to find information • Use bookmarks	• Download files from the Internet	• Use advanced search engine skills to find information • Organize, import and export bookmarks
Email Skills	• Send and receive email • Open an attachment	• Enter setting information • Send attachments • Utilize features like forward and reply • Set up signature files	• Utilize address book and create distribution lists • Create alternate mail folders and use filters • Subscribe to and participate in listserv discussion groups

Sample

Miscellaneous Skills

Voice Mail Skills	• Retrieve messages • Send messages • Record a greeting	• Record an extended absence greeting • Use advanced features such as forwarding and group distribution lists	

Audio-Visual Skills	• Be able to operate the following:
	  • VCR
	  • Overhead projector
	  • Photo copier
		• Be able to operate the following:
		  • Classroom network hookups
		  • Laserdisc player
		  • CD player
		  • Video projector
		  • Fax machine
		• Connect a laptop computer to the video system
			• Be able to operate the following:
			  • Equipment in the EPI center

Individual Technology Learning Plan for Jane Q. Trevian

This plan is intended to be complete between 7/1/99 and 6/30/00 Mentor Jerry T. Technology
The skills that are grayed out were identified as already being held during the self-assessment.
Classroom integration activities are suggestions.

Operating System Skills

	Beginning	Training Method	Intermediate	Training Method	Advanced	Training Method
General Computer Skills	• Identify computer parts • Use and locate a printer • Navigate and select menu items		• Back up files to the server		• Remove viruses from a floppy disk and the hard drive	Managing Virus Protection (Class 121) Taken 7/24/99 Reviewed w/ mentor 9/10/99
Operating System Skills	• Log on and navigate both platforms • Learn to use either Mac OS8 or Windows 95/98		• Begin a document on one platform and finish on the other • Rename files	Provided instruction sheets Reviewed w/ mentor ________	• Convert files between platforms and file types • Learn how to use both Mac OS8 and Windows 95/98	Moving Between Platforms I & II (Classes 842 & 843) Taken __________ Taken __________ Reviewed w/ mentor __________
Computer Troubleshooting	• Check electrical and peripheral connections • Check keyboard and mouse cables • Conduct a "forced quit" • Restart the computer after a system crash • Accurately report problems to the help desk		• Clear printer jams • Check status of printer with the print monitor	Printer Care and Feeding (Class 107) Taken 7/29/99 Reviewed w/ mentor __________		

Integration Activities: Check for viruses and remove same from student disks, Rename student disks for dual platform use, Assist students with printer problems in labs

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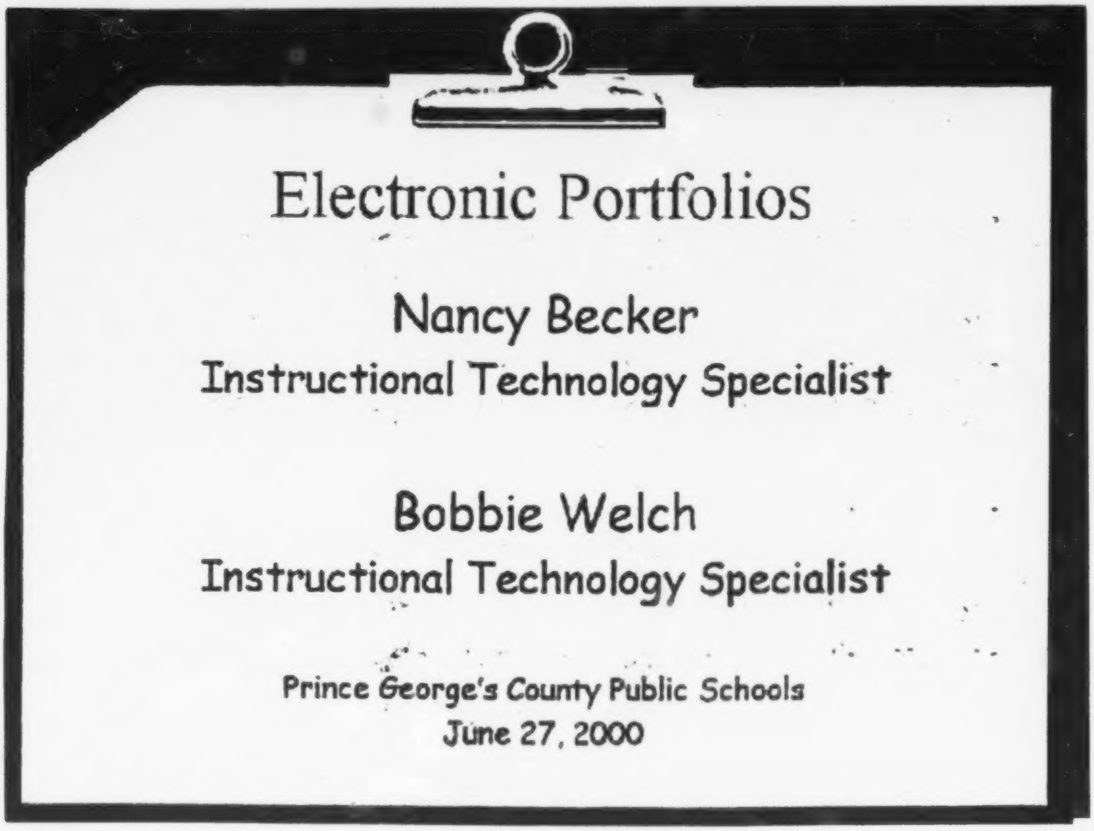

Electronic Portfolios

Nancy Becker
Instructional Technology Specialist

Bobbie Welch
Instructional Technology Specialist

Prince George's County Public Schools
June 27, 2000

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THE GREAT CHOCOLATE EXPERIENCE V

Contact Person: Glenda S. Bequette <gbequett@accessus.net>

Grades: Open to all K - 12 classes (private, public and home schoolers)

Description: The focus of the Great Chocolate Experience V is "m&m® Math or m&m® Fractional Math. Schools from all over the United States & Canada will be divided into 6 geographical regions. Students will estimate "fun-size" bags of m&m®'s to determine packaging patterns with regard to number, color and region. Schools will have the opportunity to participate in optional activities including the submission of stories, poems, recipes, etc.

Timeline: Begins January 16, 2001 - March 23, 2001 (See calendar). The last day to sign up for participation is Friday, January 5, 2001.

Objectives:

1. Develop Math Skills (computation, predicting, counting, graphing, addition, subtraction, multiplication, division, percentages, fractions, grouping information, relationships, and comparing);
2. Understand Science Processes (gathering and recording data, interpreting data estimating, classifying, predicting and sorting);
3. Develop Technology Skills (communicating via e-mail, use spreadsheets, databases, send documents via e-mail, word-processing skills, etc.);
4. Integration of Language Arts, Reading, Writing, and Social Sciences; and
5. Correlation with the Illinois Learning Standards and ISTE's Technology Profile Performance Indicators.

Participation: Each class participating will receive a copy of the recipe book and newspaper/newsletter developed through this project as well as, a certificate of participation. In addition, a Web site will be developed to showcase the schools involved.

Registration: Complete the registration form online at <http://www.iceberg.org/~gbequett/gceparti.html> A teaching packet will be sent to you after you have registered. **The online form will be available after November 1, 2000.**

Expectations: Each registered school is asked to participate in m&m® Math or m&m® Fractional Math. Additional activities (art, reading, writing, social sciences, geography, etc.) will be provided as part of the project packet, however, they are optional.

Regions:

Region 1: Alaska, Hawaii, Washington, Oregon, California, Nevada, Utah, Montana, Idaho and Arizona (10 states).

Region 2: North Dakota, South Dakota, Wyoming, Colorado, New Mexico, Texas, Nebraska, Kansas, Oklahoma, and Arkansas (10 states).

Region 3: Illinois, Missouri, Iowa, Michigan, Wisconsin, Minnesota, Indiana, Ohio, Kentucky and Tennessee (10 states).

Region 4: Louisiana, Mississippi, Alabama, Georgia, Florida, South Carolina, North Carolina, Virginia, West Virginia, Maryland, and Washington, D.C. (10 states & 1 district).

Region 5: Maine, Vermont, New York, New Jersey, Pennsylvania, New Hampshire, Rhode Island, Delaware, Connecticut, and Massachusetts (10 states).

Region 6: Canada

WWW Page: A WWW page is currently under construction. The address is: <http://www.iceberg.org/~gbequett/gce5.html>.

Volunteers are needed for the following positions:

One (1) Chocolate Central Coordinator/Class. Requirements:

1. An Energetic Teacher & class with lots of spirit and a love of **CHOCOLATE**;
2. Able to send and receive numerous e-mails from the Regional & Hub Coordinators on a daily basis;
3. An extremely reliable e-mail account;
4. Able to coordinate with the Regional & Hub Coordinators and Glenda on a daily basis; and
5. Access to e-mail on a daily basis. (preferably in your classroom)

Six (6) Regional Coordinators are needed for each of the regions. Requirements:

1. Access to e-mail on a daily basis (preferably at school);
2. Able to send and receive numerous e-mails from your regional schools on a daily basis;
3. A reliable e-mail account; and
4. Able to coordinate with Chocolate Central & your regional schools.

Seven (7) Hub Coordinators are needed for each of the Hub regions within the State of Illinois. Requirements:

1. Access to e-mail on a daily basis (preferably at school);
2. Able to send and receive numerous e-mails from your hub schools on a daily basis;
3. A reliable e-mail account; and
4. Able to coordinate with Chocolate Central, the Regional Coordinator & your hub schools.

Two (2) Recipe Book Coordinators. A Coordinator will be needed for the K - 2 Recipe Book and one for the K - 12 Recipe Book. Requirements:

1. Able to receive large amount of e-mail;
2. A reliable e-mail account;
3. Access to e-mail on a daily basis (preferably at school);
4. Able to coordinate with all of the schools involved in the Great Chocolate Experience IV;
5. Access to a software program that creates a Recipe Book;
6. Send 1 copy (original) via U.S. Postal Service to Glenda for duplication & distribution by the

requested date; and
7. These Recipe Books should be designed and word processed by the students, not the teacher.

One (1) Newspaper/Newsletter Coordinator. Requirements:

1. Able to receive large amount of e-mail;
2. A reliable e-mail account;
3. Access to e-mail on a daily basis (preferably at school);
4. Able to coordinate with all of the schools involved in the Great Chocolate Experience IV;
5. Access to a software program that creates a Newspaper/Newsletter;
6. Send 1 copy (original) via U.S. Postal Service to Glenda for duplication and distribution by the requested date; and
7. This newspaper should be designed and word processed by the students, not the teacher.

Eight (8) Certificate Coordinators. Requirements:

1. Coordinate with Glenda to design and print participation certificates for the Great Chocolate Experience IV participants;
2. Access to e-mail on a daily basis (preferably at school);
3. Able to receive large amounts of e-mail;
4. A reliable e-mail account;
5. Access to a software program that creates certificates;
6. Send certificates via the U.S. Postal Service to Glenda for distribution by the requested date; and
7. These certificates should be designed and printed by the students, not the teacher.

If you are interested in any of these positions, please notify Glenda or check the appropriate box on the participation form.

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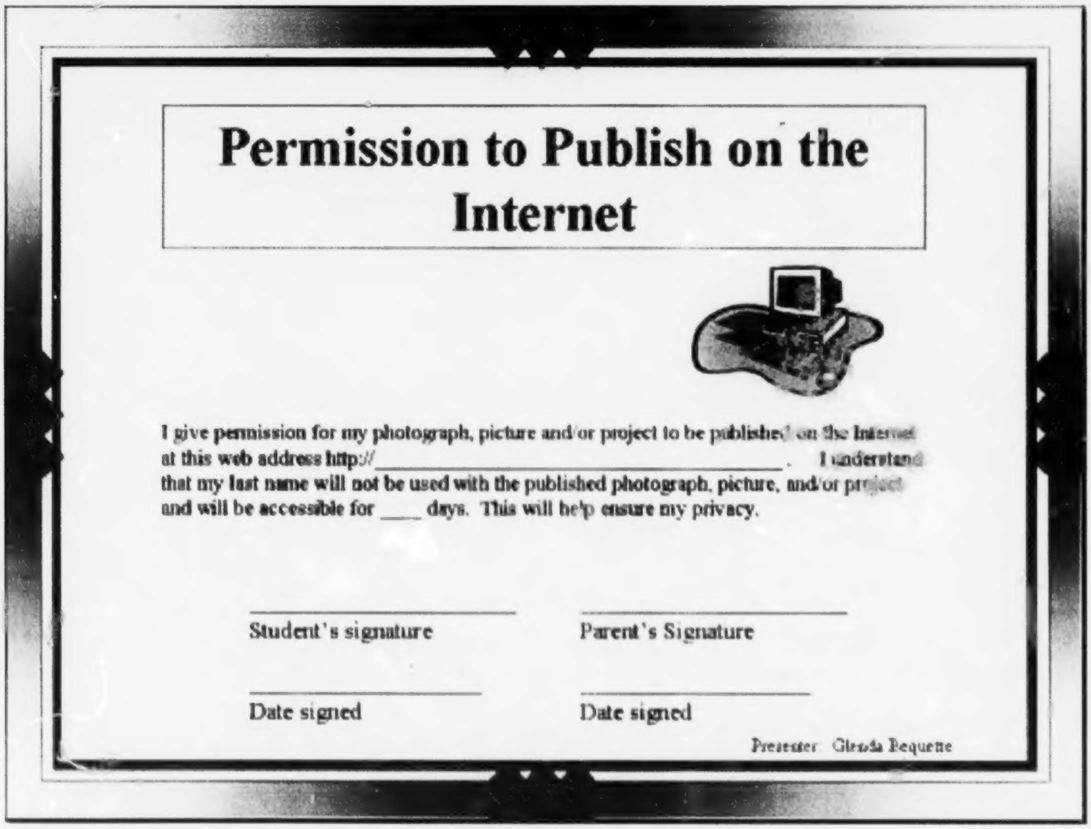

Permission to Publish on the Internet

I give permission for my photograph, picture and/or project to be published on the Internet at this web address http://________________________________. I understand that my last name will not be used with the published photograph, picture, and/or project and will be accessible for ____ days. This will help ensure my privacy.

______________________ Student's signature	______________________ Parent's Signature
____________________ Date signed	____________________ Date signed

Presenter: Glenda Bequette

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CHOCOLATE TEST

1. How many **Hershey's Kisses** chocolates can be produced in a day?

a. 12 million
b. not enough
c. 33 million

2. In what year were **Hershey's Kisses** chocolates first produced?

a. 1921
b. 1907
c. before I was born

3. Which chocolate baking product can be included in fat-restricted diets?

a. **Hershey's** cocoa
b. **Hershey's** baking chocolate
c. **Hershey's** chocolate chips

4. What was the first product advertised by Hershey Foods Corporation?

a. **Hershey's** syrup
b. **Hershey's** milk chocolate bar
c. **Mr. Goodbar** chocolate bar

5. Approximately how many **Hershey's Kisses** chocolates are in a pound?

a. 26
b. don't know, but they taste great!
c. 95

6. About how many cows are needed to provide enough milk for one day's production at the main plant in Hershey, Pa.?

a. 50,000
b. barnyard full
c. 33,500

7. How many calories are there in a Hershey's Kisses chocolate?

a. 25 calories
b. none (little foods don't count)
c. 50 calories

8. How many **Hershey's** chocolate chips are in a pound?

a. about 1,000
b. about 500
c. about 376

9. At about what temperature does chocolate begin to melt?

a. 78 degrees F
b. sunny and 90 degrees F
c. 95 degrees F

10. What is our best selling product?

a. **Reese's** peanut butter cups
b. **Hershey's** milk chocolate bar
c. **Hershey's** Kisses chocolates

11. What do the street lights on Chocolate Avenue in Hershey, Pa., look like?

a. **Hershey's Kisses** chocolates
b. **Reese's** peanut butter cups
c. lanterns

12. What words are spelled out in hedges in front of the main plant in Hershey, Pa.?

a. Welcome to Hershey
b. Hershey Cocoa
c. Hope you enjoy your visit

13. How long does it take to make a **Hershey's** milk chocolate bar?

a. about 17 days
b. about 21 days
c. about 10 days

Presenter: Glenda S. Bequette

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HOCOLATE COVERED TRIVIA

1. Where can you go in the United States and smell chocolate all the time?

a. Cocoa Beach, Florida
b. Hershey, Pennsylvania
c. Carmel, California

2. Can you guess how many chocolate bars the largest chocolate factory makes each year?

a. over a million
b. over a billion
c. over a trillion

3. It takes almost one quart (about 1 liter) of milk to make a one-pound bar of milk chocolate -- true of false?

4. White chocolate has real chocolate in it -- true of false?

5. What does "M & M®" stand for?

6. How did Hershey's Kisses® get their name?

a. Mr. Hershey's wife kissed him after she tried his tasty new candy.
b. They were first made for Valentine's Day gifts.
c. "Kiss" is an old name for any small piece of chocolate wrapped in foil.

7. If you eat lots chocolate, you'll get lots of:

a. cavities
b. pimples
c. both cavities and pimples
d. neither cavities nor pimples

8. What was the name of the famous character who had his own chocolate factory?

a. Charlie Brown
b. ET
c. Willy Wonka
d. Donald Duck

9. Would the world's tallest chocolate egg have fit inside your bedroom?

a. sure--it was about the size of a watermelon
b. probably--it was about 7 feet (2 meters) tall
c. no way--unless you have an 18-foot (51/2 meters) ceiling.

10. Where do you think the first chocolate bunny was made?

a. England

b. Australia
c. Pennsylvania
d. Disney World

11. Which of these things do you think have been made out of chocolate?

a. jigsaw puzzle
b. chess set
c. model of a computer diskette
d. model of the Statue of Liberty
e. all of these

ANSWERS:

1. (B) Chocolate fans go wild in Hershey, the famous home of the Hershey® Chocolate Company. The town smells of different kinds of chocolate each day, depending on what the factory is making.

2. (B) Over a billion chocolate bars are made each year at Hershey's factory.

3. TRUE

4. FALSE. White chocolate contains lots of cocoa butter, which comes from cacao beans. But it doesn't have the secret ingredient of all "true chocolate": chocolate liquor.

5. (B) M & M® candies may be munchy and mouthwatering, but they were named after their inventors, Forrest Mars and Bruce Murrie

6. (C)

7. (D) As far as scientist can tell, Pure chocolate does not cause pimples. And chocolate may protect your teeth against cavities. It's the sugar and other things added to chocolate candy that cause problems.

8. (C) Willy Wonka and the Chocolate Factory was a movie that was based on the book Charlie and the Chocolate Factory by Raoid Dahl.

9. (C) The giant egg was 17 feet, 9 inches (about 5 1/2 m) tall and it weighed over 2 1/2 tons (2250 kg).

10 (D)

11. (E) All of those things and more have been out of chocolate by chocolate makers all over the world.

Presenter: Glenda S. Bequette

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Name: ______________________________
Date: ______________________________

m&m FRACTIONAL MATH

1. Do not open your bag. Estimate how many m&mÒ's are in your bag. ____________ Graph and write your estimate of each color.

B = Blue G = Green O = Orange
Y = Yellow R = Red DB = Dark Brown

set **B** = _________ set **G** = _________ set **O** = _________
set **Y** = _________ set **R** = _________ set **DB** = _________

2. Open your bag. Put your m&mÒ's into sets by color. Graph your actual count of each color.

3. Write the number of m&mÒ's in each set.

set **B** = _________ set **G** = _________ set **O** = _________
set **Y** = _________ set **R** = _________ set **DB** = _________

4. How many m&m's are in the bag? ____________

5. How far off was your estimate? ________________

6. Write the fraction for each color in your bag. The answer should be written with the lowest common denominator.

B = _________ G = _________ O = _________
Y = _________ R = _________ DB = _________

7. Write the percentage of each color in your bag.

B = _________ G = _________ O = _________
Y = _________ R = _________ DB = _________

8. Using the percentage that you discovered in number 7, write the decimal equivalent.

B = _________ G = _________ O = _________
Y = _________ R = _________ DB = _________

9. Using > or < or =, show the relationship between these sets.

G _________ R Y _________ DB Y _________ B
O _________ G B _________ DB G _________ Y
G _________ B Y _________ R G _________ DB

10. Complete these problems.

B + DB = ________

R - O = ________

R x G = ________

O x G = ________

R + Y = ________

Y - B = ________

O - B = ________

G x B = ________

DB x R = ________

Make up 4 problems (+, -, or x) of your own.

11. On a separate sheet of paper, draw a circle graph that illustrates the percentage of m&mÒ's in your bag.

12. Are all bags of m&m's the same? Find out!! Compare graphs with four (4) other students.

13. m&m's have between ________and ________candies in a bag.

14. My least common color is ____________.

15. My most common color is ____________.

16. My class's least common color is ____________.

17. My class's most common color is ____________.

18. Be sure to title your graph in the space provided.

19. Congratulations you've succeeded in helping determine packaging patterns for m&m's. So enjoy -- eat them, save them or take them home.

Presenter: Glenda S. Bequette

WORK AREA:

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CHOCOLATE FUN FACTS

On average, each American ate 11.5 pounds of chocolate in 1995. That's over 3 billion pounds total.

The retail chocolate industry in the U.S. is worth $13 billion per year.

Valentine's Day still means Chocolate. Americans spend $665 million each Valentine's Day on candy, making it the fourth biggest holiday of the year for confectionery purchases (after Halloween, Christmas and Easter).

American men say they'd rather receive chocolate than flowers on Valentine's Day, especially those over the age of 50. Sixty-eight percent of men age 50 or older say they'd prefer receiving chocolate over flowers from their sweetheart on Valentine's Day, while just 22% said they'd rather have the flowers.

The first "chocolate box" was introduced by Richard Cadbury in 1868, when he decorated a candy box with a painting of his young daughter holding a kitten in her arms. Cadbury also invented the first Valentine's Day candy box. *

Chocolate manufacturers use 40% of the world's almonds, 20% of the world's peanuts and 8% of the world's sugar. Members of the Chocolate Manufacturers Association use about 3.5 million pounds of the whole milk each day to make milk chocolate. *

* from Chocolate Fads, Folklore and Fantasies, Linda K. Fuller, Ph.D.,1994

History of U.S. Per Capita Consumption
Chocolate

	Pounds per person
1983	**9.67**
1984	**10.0**
1985	**10.1**
1986	**10.1**
1987	**10.2**
1988	**10.4**
1989	**11.2**
1990	**11.5**
1991	**10.6**
1992	**10.6**
1993	**10.9**
1994	**10.8**

Davis, Anne

"Blooming" Critical Thinkers
Bloom's Taxonomy Blue Ribbon Display
Bloom's Taxonomy Question Teaching Resources for Knowledge
Bloom's Taxonomy Question Teaching Resources for Comprehension
Bloom's Taxonomy Question Teaching Resources for Application
Bloom's Taxonomy Question Teaching Resources for Analysis
Bloom's Taxonomy Question Teaching Resources for Synthesis
Bloom's Taxonomy Question Teaching Resources for Evaluation
Current Events URLs
Original Author Submissions

Dede, Chris

Using Immersive Virtual Worlds in Real World Classrooms (pdf format)

Ditson, Mary

How to Create WEB PAGES with Inspiration (pdf format)
Brainstorming with an AlphaSmart (pdf format)
Textbook Notetaking with an AlphaSmart (pdf format)
Textbook Notetaking with an AlphaSmart (cont) (pdf format)
Making Your Inspiration Outlines TALK (pdf format)
Letting the Computer do the TYPING (pdf format)
Structured Writing Templates help students meet Writing Standards (pdf format)
Literary webs help students meet Language Arts Standards (pdf format)
Concept Maps help students meet Science Standards (pdf format)
Concept Maps help students meet Social Science Standards (pdf format)

Donohue, Pat

Linking Learning to Life: Model, Tools and Strategies Linking Electronic and Real Communities
Original Author Submissions

Drake, Kris

DLS Network News
Original Author Submissions

Evans, John

NASA's Education Program
Original Author Submissions

Fitzgerald, Sara

Putting TCO to Work
Original Author Submissions

Garton, Juli

Web Based Staff Development

Glotzbach, Joe

Trails Project Cyberneers: Integrating Technology with History
Original Author Submissions

Greenwood, Karen

Thin Client @ School: Thin-Client Solutions for K-12 Schools (pdf format)
Thin Client @ School: Enriching Education through Affordable Technology
Original Author Submissions

Griswold, Debbie

Integrating Technology into the Language Arts Curriculum
Listserv / Mailing Lists
Works Cited
Original Author Submissions

Guhlin, Miguel

Creating Web Based Lessons: WebQuests & Other Internet Projects
Creating Web Based Lessons: WebQuests & Other Internet Projects - Cover Page
Getting Graphics & Text
Creating a Web Page with FrontPage Express
Original Author Submissions

Gutterman, Liz

Laptops Even the Score for Urban Learners
Original Author Submissions

Hallstrom, Barbara

Children and Search Engines: What's the Big Deal?
Original Author Submissions

Hawkins, Joyce

Musical Crossroads: The Rhythm of Technology Handouts
Lesson Plan for Standards-Based Technology-Integrated Instruction (pdf format)
Original Author Submissions

Hayes, Jeanne

K-12 Education Technology Update
Original Author Submissions

Hirsch, Jim

HyperInternet: Interactive Internet Activities (pdf format)

Horan, Mike

SeaTrek: Implementation of Telementors in Middle-School Science
Original Author Submissions

Houser, Mike

Computer! Heal Thyself!
Original Author Submissions

Howell, Tricia

GCPS Technology Assessment Model
Teaching and Learning - Definition and Scoring Rubric
Gwinnett County Technology Needs Assessment Survey
Technology Assessment Model Implementation Plan Template
Original Author Submissions

Hunt, Adrianne

Research, Replication, Results: INtegrating TECHnology from Georgia to Louisiana Classrooms
A Professional Development Model for Integrating Technology in the Student-Centered Classroom
Technology-Connected Lesson Plan
Original Author Submissions

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Bloom's Taxonomy
Blue Ribbon Display

Knowledge	Comprehension	Application	Analysis	Synthesis	Evaluation
recall	review	use	order	arrange	select
remember	explain	apply	group	organize	recommend
match	discuss	practice	categorize	plan	rate
define	summarize	construct	examine	predict	rank
describe	paraphrase	interpret	inspect	produce	critique criticize
list	illustrate	dramatize	infer	design	evaluate
name	compare	show	analyze	develop	conclude
state	locate	demonstrate	contrast	invent	judge
tell	identify	give an example	detect	create	decide

Knowledge - You can recall or record information, concepts, and ideas in the approximate form that they were learned.

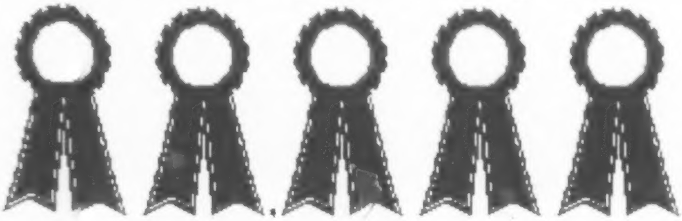
Comprehension - You can grasp and interpret prior learning.

Application - You can transfer information to a life problem or new task.

Analysis - You can examine, take apart, classify, predict, and draw conclusions.

Synthesis - You can originate, combine and integrate prior knowledge into a product, plan or new proposal.

Evaluation - You can appraise, assess or criticize on the basis of specific standards or criteria.



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Bloom's Taxonomy
Question Teaching Resources for Knowledge

Knowledge	**Describe** John Glenn's liftoff into space on October 29, 1998.
Knowledge	Can you **recall** the youngest gold medallist in the Winter Olympics?
Knowledge	**List** the people you admire the most. (Jimmy Carter, Oprah Winfrey, Bill Cosby, Mother Teresa, Madeleine Albright, Ghandi, Michael Jordan, Princess Diana)
Knowledge	**Tell** about the plight of the sea otter.
Knowledge	Do you **remember** the name of Germany's president?
Knowledge	**State** the crash location of SwissAir Flight 111.
Knowledge	**Name** the Secretary-General of the United Nations.
Knowledge	**Define** the British Monarchy.
Knowledge	**Match** these countries and currencies. (France-franc, Mexico-peso, Great Britain-pound, Japan-yen, Italy-lira, United States-dollar, Russia-ruble)

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Bloom's Taxonomy
Question Teaching Resources for Comprehension

Comprehension	**Summarize** the issues facing Benjamin Netanyahu and Yasser Arafat as they participate in the Middle East Peace Talks.
Comprehension	**Discuss** the advantages of Bilingual Education.
Comprehension	**Compare** inflation to deflation.
Comprehension	**Identify** the bacteria responsible for the contamination of hamburger meat in recent news.
Comprehension	**Illustrate** the new Furby.
Comprehension	Review the capture and release of the three American POW" in Kosovo.
Comprehension	**Locate** Iraq on a world map.
Comprehension	**Explain** the reasons for Pope John Paul's visit to Cuba.
Comprehension	**Paraphrase** President Clinton's State of the Union Address.

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Bloom's Taxonomy **Question Teaching Resources for Application**	
Application	**Show** how a balanced budget affects our nation.
Application	**Demonstrate** the African capoeira dance, now popular in Brazil.
Application	**Put into practice** a water conservation plan in your own household.
Application	**Using** the Congressional ruling for the salmon fishermen, tell why the sea lion population has tripled on the West Coast.
Application	**Apply** your knowledge of the Middle East Peace Talks, the Iraq Standoff, and the current crisis in Kosovo, and tell how the politics of one country can affect the entire world.
Application	Using your knowledge about Bill Gate's Microsoft empire, **dramatize** a make-believe community of businesses and consumers.
Application	**Construct** a replica of the Oklahoma tornado damage.
Application	**Give examples** of how the Clintons do things together.
Application	**Interpret** the significance of Yeltsin's firing of his political cabinet.

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Bloom's Taxonomy **Question Teaching Resources for Analysis**	
Analysis	**Appraise** the significance of President Clinton's trip to Africa.
Analysis	**Examine** Eric Rudolph's disappearance.
Analysis	**Group** the countries that are pro and con about the current conditions in Iraq.
Analysis	**Criticize** the use of in-depth television during military warfare.
Analysis	**Analyze** the similarities between the Holocaust and the current crisis in Kosovo.
Analysis	**Investigate** the toxicity level of seabirds living off the Great Lakes in the U.S.
Analysis	**Place in order** a timeline of events depicting the collapse of Russia's economy.
Analysis	What can you **detect** about the Inca's way of life from the mummified children recently found by archaeologists?
Analysis	**Research** the long-simmering tensions between Serbian authorities and independence-seeking ethnic Albanians in Kosovo.

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Bloom's Taxonomy
Question Teaching Resources for Synthesis

Synthesis	International Women's Day has recently been introduced as a holiday. **Predict** a new holiday that will be created 20 years from now.
Synthesis	**Develop** a disaster plan for citizens to follow regarding the weird weather from El Nino.
Synthesis	Due to storms from El Nino, **create** an evacuation plan for people living near water.
Synthesis	**Arrange** in chronological order the flight path of the two hot air balloonists' trip around the world.
Synthesis	**Design** a wheeled apparatus for students to use, replacing heavy backpacks.
Synthesis	**Organize** a volunteer group to participate in Jimmy Carters' "Habitat for Humanity""organization.
Synthesis	**Produce** a planned agenda for your community to temporarily shelter ethnic-Albanian refugees.
Synthesis	With the millennium fast approaching, **prepare a presentation** about how the Y2K problems might impact society if they are not addressed by the year 2000.
Synthesis	**Develop** a list of resources for parents to use on counseling teenage behavior.

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Bloom's Taxonomy
Question Teaching Resources for Evaluation

Evaluation	**Judge** the merits of the Northern Ireland Peace Talks.
Evaluation	**Critique** the role of television in shaping people's opinions.
Evaluation	**Draw a conclusion** about Maya Quest's effect on modern civilization.
Evaluation	**Rate** the importance of homework to the achievement of academic success.
Evaluation	**Recommend** constraints against industry to diminish global warming.
Evaluation	**Select** from the list of potential presidential candidates the individual you believe most capable of leading our country into the 21st century.
Evaluation	How does Mark McGwire **rank** among other baseball greats?
Evaluation	**Decide** how much impact Bill Clinton's impeachment will have on how history records his presidency.
Evaluation	**Evaluate** certain ways our American society has desensitized its young people to violence.

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Current Events URLs

CNN Newsroom	http://learning.turner.com/newsroom/index.html
Time for Kids	http://www.timeforkids.com/TFK/index.html
Scholastic News Online	http://teacher.scholastic.com/newszone/index.asp
Currents Events Theme Page	http://www.cln.org/themes/current.html
Weekly Reader (links to News Busters Game)	http://www.weeklyreader.com/features/ce.html
NewsCurrents Online	http://www.newscurrents.com/
CBC for Kids	http://www.cbc4kids.ca/regular/homepage.html
Pencil News	http://www.msnbc.com/local/pencilnews/default.asp
Twenty-five Great Ideas for Teaching Current Events!	http://www.education-world.com/a_lesson/lesson072.shtml
NewsMaker Profiles	http://www.cnn.com/resources/newsmakers/world/namerica/castro.html
Information Please: Facts Behind the News	http://kids.infoplease.com/main/newsfacts.html
Daryl Cagle's Professional Cartoonist Teacher's Guide	http://www.cagle.com/teacher/

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Link to their site at http://www.arttoday.com

Using Immersive Virtual Worlds in Real World Classrooms

Chris Dede, Mark Johnston, Terri Siggins, and Debra Sprague
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George Mason University
Fairfax, VA 22030
CDede@gmu.edu
http://www.virtual.gmu.edu

Within the next decade, via the videogame industry, "virtual reality" devices capable of multisensory immersion will be ubiquitous in rich and poor homes, urban and rural areas. To compete with the captivating, but mindless types of entertainment that will draw on this power, educators will need beautiful, fantastic, intriguing environments for learning. Our work is beginning to chart these frontiers, as well as revealing which of virtual reality's (VR) promising features for learning are useful, which are not. To engage in effective strategic planning, all educators need to understand the opportunities and challenges of "on the horizon" technologies such as VR.

Project ScienceSpace is a collection of virtual worlds we have designed to explore the potential utility of physical immersion and multisensory perception to enhance science education. Funded by the National Science Foundation over the past six years, ScienceSpace now consists of two worlds: NewtonWorld (for elementary students learning Newtonian dynamics and mechanics) and, MaxwellWorld (for secondary students learning electrostatics as an example of vector fields). We have conducted extensive laboratory research that demonstrates virtual reality has significant benefits for helping a broad range of students learn complex conceptual material. Research publications, Quicktime VR files, Quicktime movies, and images from our worlds can be downloaded from our website: http://www.virtual.gmu.edu

Practical advice for educators at every level about preparing for VR is important, because this technology is perhaps three years away in terms of desktop affordability and seven years away from being "under the Christmas tree" in videogames. Exploring the potential of home-based devices for learning is particularly important because of the high costs of keeping school-based instructional media current with technologies routine in business settings. The goal espoused by many today of multimedia-capable, Internet-connected classroom computers for every two to three pupils carries a staggering price tag—especially if those devices are obsolete five to seven years after installation.

While providing adequate, sophisticated school-based instructional technologies is extremely important, it is vital to leverage this investment via simultaneous utilization of entertainment and information-services devices in family and community settings. Using technology to aid educational reform through systemic innovation must occur on two levels simultaneously: drawing one boundary of the system around the school, with student-teacher-technology partnerships; and another system boundary around the society, with classroom-family-workplace-community-technology partnerships. Such an innovation strategy necessitates developing learning materials—including "edutainment"—for emerging technologies such as virtual reality that can empower learning both in and out of school.

In Spring, 2000, we placed VR systems into five public school classrooms to explore the strengths and limits of this emerging technology in real educational settings. We are developing findings about the integration of VR devices in real world classrooms. Issues include links to curricular science standards, student performance on conventional assessments, issues with simulator sickness, the durability of high-end VR devices, and special accommodations teachers must make. We are also studying the differences between how elementary and secondary pupils respond and are deriving the implications of our research for instructional design. Our website contains publications about this work. We appreciate any feedback you care to provide -- thanks!

How to Create WEB PAGES with Inspiration®

Easy as pie!

I. Create the content.

Keep in mind that each of the "topics" (I, II, III, etc.) will be a separate page.

Put all of the words for each page as NOTES under the topics.

(If you add subtopics, these will appear on the web pages, but they won't BE separate web pages.)

II. Convert to HTML.

In Inspiration®

A. Choose File: Export...

B. In the Export... dialog box, choose

1. Outline Formats: HTML - Multiple Web Pages

2. Export Options: One Page Per Topic

3. Click OK

a. A dialog box will cue you to:

(1) Place it

(2) Name it

Note: Inspiration® then automatically creates separate, linked html documents for each of the topics you created!

III. See how it will look.

Here are the steps:

A. Open Netscape Navigator® (or other web browser)

B. Choose File: Open

Navigate to find the home page (by whatever name you just gave it).

C. Voila!

You will be able to click on the links to get to the other pages, and each has a "Home" button.

Computer-Based Study Strategies

CBSS

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BRAINSTORMING

BRAINSTORMING with an AlphaSmart®

and a desktop computer with
Inspiration® software.

When to use it

- **You have an AlphaSmart®**
- **You want to get a lot of ideas out fast.**
- **You want to see the ideas visually displayed.**
- **You want to be able to work with the ideas freely.**

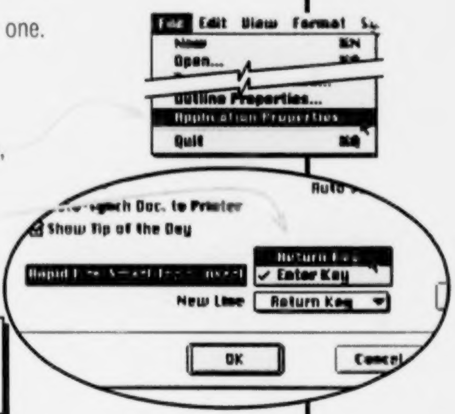
How to do it

1 **Generate** ideas on the AlphaSmart®.

- Turn on the AlphaSmart and choose any file to work in.
- Type in the topic (main idea) of the Brainstorm first. Press the "Return" key. (On PC's, use the right-pinky "Enter" key.)
- Type in other ideas freely, pushing "Return" (or "Enter") after each one.

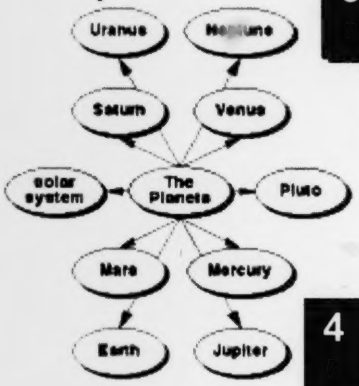
2 Get Inspiration® ready.

- On your desktop computer, in Inspiration® , open the File menu, then "Application Properties…"
- Set "Rapid Fire/Smart Topic Insert" for "Return Key" and click "OK." (On version 6, set "Return" key to give "New Topic".)
- Make sure the words "Main Idea" are highlighted.


File Edit View Format
New
Open...
Outline Properties...
Application Properties
Quit
Auto
Show Tip of the Day
Return Key
✓ Enter Key
New Line
Return Key
OK
Cancel

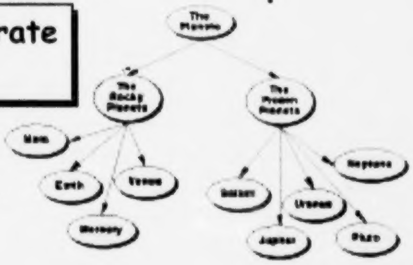
3 **Send** the AlphaSmart® ideas to Inspiration®.

- Press option-command-S and type "2" (slow).
- Hook up the AlphaSmart to the desktop computer, using it to replace the keyboard or adding it using a Y-cord.
  - Press the "Send" key.
  - Enjoy watching your words come to life!


Uranus
Neptune
Saturn
Venus
solar system
The Planets
Pluto
Mars
Mercury
Earth
Jupiter

4 Use Inspiration® to **orchestrate** and **elaborate** your ideas.

- Use the freedom of the electronic environment to work with your ideas. You can: Add ideas and delete ideas. Move and change symbols. Group ideas according to categories.
- Click "Outline" and work with the ideas in Outline view.
- The sky is the limit!


The Planets
Earth
Venus
Mercury
Neptune
Uranus
Jupiter
Pluto

Computer-Based Study Strategies CBSS

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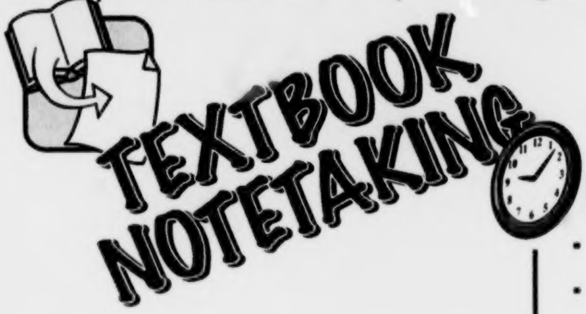


TEXTBOOK NOTETAKING

with an AlphaSmart®
and a desktop computer with Inspiration® software.

When to use it

- **You have an AlphaSmart®.**
- **You want to learn from what you read.**
- **You want to be able to study your notes effectively.**

How to do it

1 Type headings on the AlphaSmart®, one per file.

- Turn on the AlphaSmart and open File 1.
- Type in the first heading IN CAPS. Press the "Return" key. (On PC's, use the right-pinky "Enter" key.)
- Open File 2. Type in the second heading IN CAPS.
- Proceed through the rest of the headings.
- In the last file, type in the word VOCABULARY.

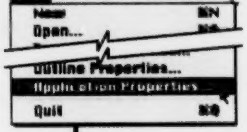
2 Fill in the details on the AlphaSmart®.

- Go back to File 1. Read the material under the first heading.
- Translate the first idea into a few key words, and type them in. Press the "Return" (or "Enter") key.
- Add another few words, push "Return" (or "Enter").
- Continue until you have put in all the important ideas under the first heading.
- Emphasis "big" ideas, e.g. capitalizing them. Mark "small" ideas, e.g. by putting dashes before them.
- Go to File 2 and repeat this process, then File 3, and so on.

3 Add Vocabulary on the AlphaSmart®.

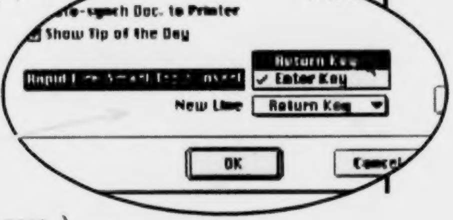
As you fill in the details (or afterwards), use your VOCABULARY file as a place to type in words you want to learn. Underneath each word, type the definition.

4 Get Inspiration® ready.


File
Edit
View
Format
New
Open...
Outline Properties...
Application Properties...
Quit

- On your desktop computer, in Inspiration® , open the File menu, then "Application Properties…"

- Set "Rapid Fire/Smart Topic Insert" for "Return Key" and click "OK." (On version 6, set "Return" key to give "New Topic".)


Auto
…-synch Doc. to Printer
Show Tip of the Day
Rapid Fire/Smart Topic Insert
Return Key
✓ Enter Key
New Line
Return Key
OK
Cancel

(Continued on next page...)

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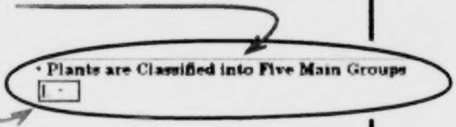
TEXTBOOK NOTETAKING

with an AlphaSmart®
and a desktop computer with
Inspiration® software.

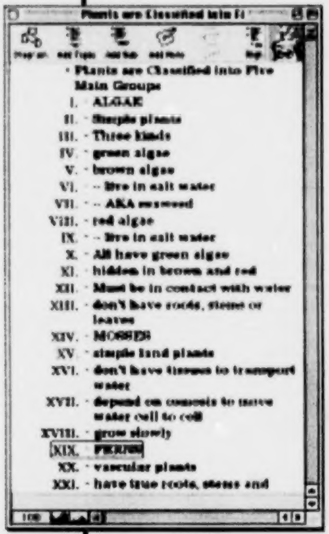
(...continued from previous page)

- Instead of "Main Idea," type in the name of the article/chapter.
- Push return for a new line; it will have the prefix "I."


• Plants are Classified into Five Main Groups
I. -

5 Get the AlphaSmart® ready.

- Important!! Press option-command-S to adjust the speed, and press 2 (or 1).
- Open File 1.
- Hook up the AlphaSmart to the desktop computer, using it to replace the keyboard or adding it using a Y-cord.



• Plants are Classified into Five Main Groups
I. - ALGAE
II. - Simple plants
III. - Three kinds
IV. - green algae
V. - brown algae
VI. - -- live in salt water
VII. - -- AKA seaweed
VIII. - red algae
IX. - -- live in salt water
X. - All have green algae
XI. - hidden in brown and red
XII. - Must be in contact with water
XIII. - don't have roots, stems or leaves
XIV. - MOSSES
XV. - simple land plants
XVI. - don't have tissues to transport water
XVII. - depend on osmosis to move water cell to cell
XVIII. - grow slowly
XIX. - FERNS
XX. - vascular plants
XXI. - have true roots, stems and

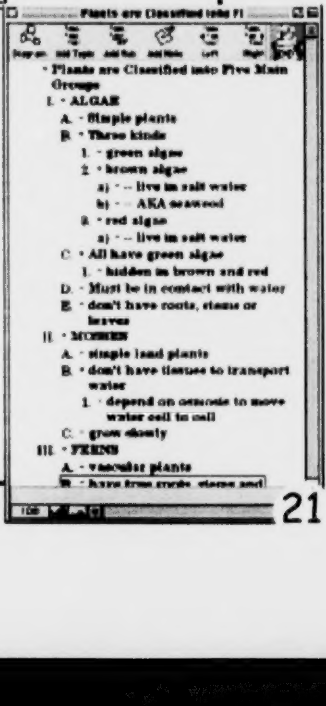
6 Send the notes to Inspiration®.

- Press the "Send" key.
- Enjoy watching your notes appear! This is a good way to absorb the material.
- Press the "Return" key (on either machine) to start a new line.
- Push option-command File 2 (F2) to open File 2. Press the "Send" key to add this material to the outline.
- Continue through all the files.

7 Use Inspiration® to manipulate (learn) the material.

- Go through the list and turn it into a real outline.
- Select a line and delete or move it (to indent, or move to the right, just push Tab).
- Add lines of information as you wish.
- The more you manipulate the material, the better you will learn it.

Hint: In the vocabulary section, move all the definitions to the right, under their words. This way you can use "Hide/Show Subtopics" (in Toolbar as "+/- sub", or by double clicking to the left of the line) to quiz yourself on the words!



• Plants are Classified into Five Main Groups
I. - ALGAE
  A. - Simple plants
  B. - Three kinds
    1. - green algae
    2. - brown algae
      a) - -- live in salt water
      b) - -- AKA seaweed
    3. - red algae
      a) - -- live in salt water
  C. - All have green algae
    1. - hidden in brown and red
  D. - Must be in contact with water
  E. - don't have roots, stems or leaves
II. - MOSSES
  A. - simple land plants
  B. - don't have tissues to transport water
    1. - depend on osmosis to move water cell to cell
  C. - grow slowly
III. - FERNS
  A. - vascular plants
  B. - have true roots, stems and

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Making Your Inspiration® Outlines TALK

Students are more motivated to write when they can make the computer SAY what they have written. For some students, being able to HEAR their notes or study outlines will make learning much easier.

I. Choose a program.

A. All Macintosh computers are equipped with "Simple Text."

B. Use Don Johnston's WRITE: OUTLOUD

C. Recent versions of Microsoft Word have the ability to "speak."

II. Using Simple Text

A. Select and copy your outline (if the information is in a map, click "Outline" first).

B. Open Simple Text

C. Paste

D. Highlight all (command-A)

E. Choose Sound: Speak All (command-H)

Note: You may want to go to Sound: Voices and choose a voice. Voice preference is individual.

III. Using WRITE: OUTLOUD

A. In Inspiration
  1. Select your entire outline (command-A)
  2. Copy

B. In a word processing program (e.g. Word)
  1. Open a new document
  2. Paste
  3. Replace carriage returns as follows:
    a. Choose Edit:Replace (command-H)
    b. Replace ^p with .^p
  4. Select entire document
  5. Copy

C. In WRITE: OUTLOUD
  1. Open new document
  2. Paste
  3. Unselect "Highlight Word by Word"
    a. Use "Read Sentences" and/or "Read Paragraphs"
  4. Set up with desired voice and speed
    Princess at 180 wpm works well
  5. Set pointer so that clicking allows you to hear next sentence, and next, and next..
    Note: You may want to work with the "pronunciation" feature.

Letting the Computer do the TYPING

Technology is making it easier and easier for students to express themselves, even if typing and spelling are difficult!

I. Choose a program.
  A. Use Don Johnston's CO:WRITER for Word Prediction
  B. Consider voice recognition software
    1. Dragon Dictates' Naturally Speaking
      a. Use "preferred"
      b. Works best with Pentium III processors
    2. Try other voice recognition programs

II. Using CO:WRITER
  A. Launch CO:WRITER First!
  B. Then, open Inspiration
  C. To bring CO:WRITER to the front, use the "wake up key" +=
  D. Customize CO:WRITER
    1. Select number of words to suggest
    2. Format as desired
    3. Use "CO:WRITER Help" in Apple Menu to answer questions.

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Structured Writing Templates help students meet **Writing Standards**

from: **Structured Writing Process**
by **Chuck Haynes** and **Kathleen McMurdo**
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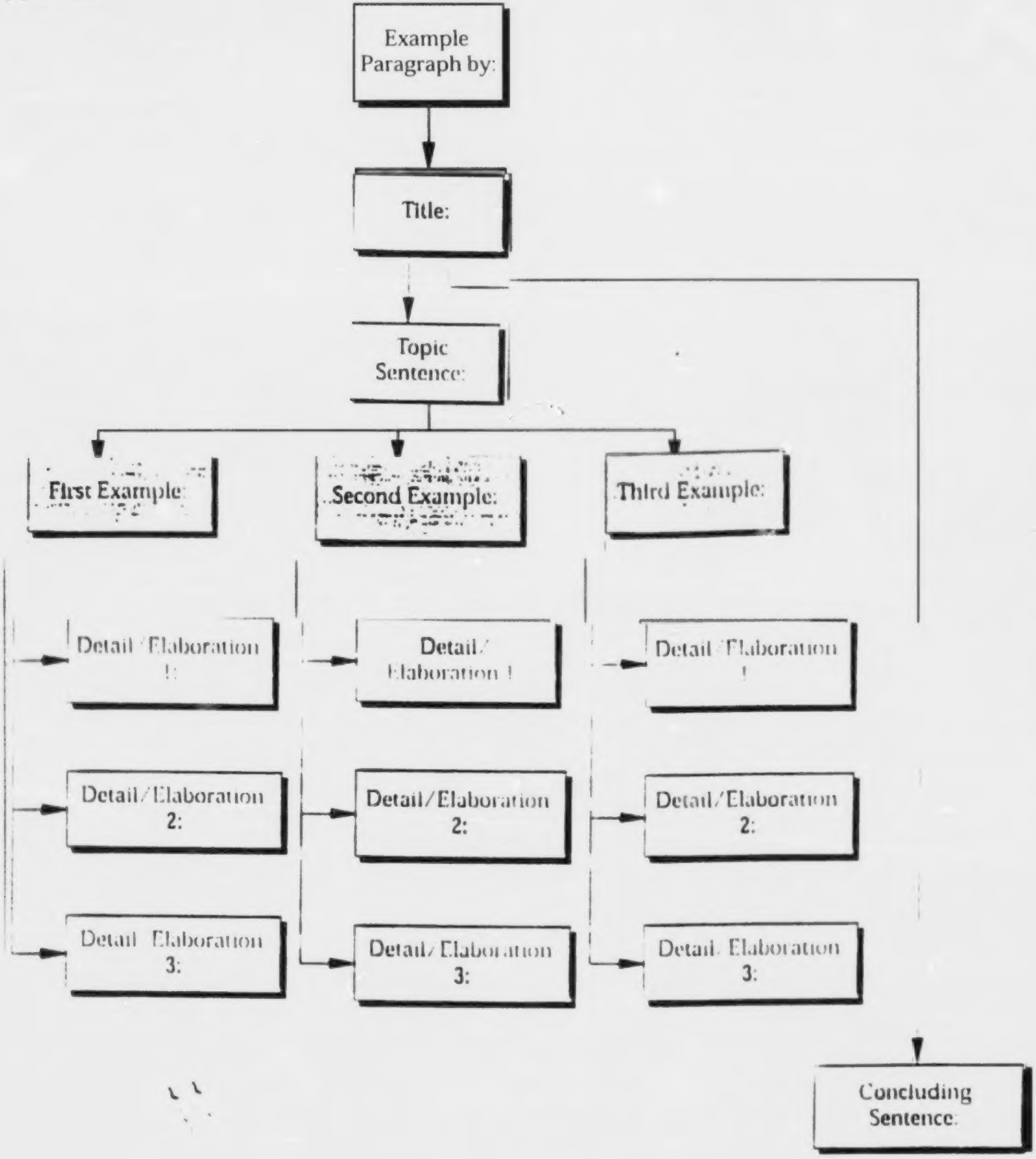
Example Paragraph by:
Title:
Topic Sentence:
First Example:
Second Example:
Third Example:
Detail/Elaboration 1:
Detail/Elaboration 1:
Detail/Elaboration 1:
Detail/Elaboration 2:
Detail/Elaboration 2:
Detail/Elaboration 2:
Detail/Elaboration 3:
Detail/Elaboration 3:
Detail/Elaboration 3:
Concluding Sentence:

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Literary webs help students meet
Language Arts Standards

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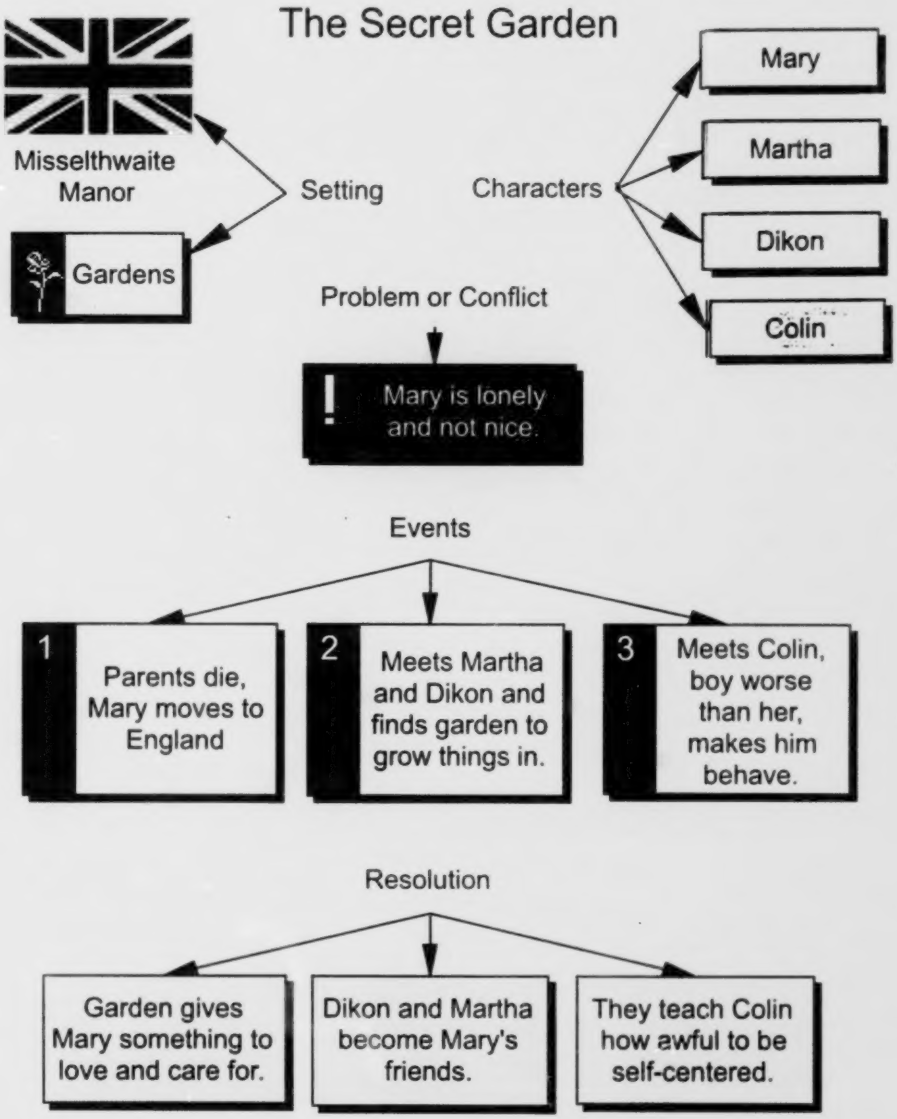
The Secret Garden
Misselthwaite Manor
Setting
Gardens
Characters
Mary
Martha
Dikon
Colin
Problem or Conflict
Mary is lonely and not nice.
Events
1 Parents die, Mary moves to England
2 Meets Martha and Dikon and finds garden to grow things in.
3 Meets Colin, boy worse than her, makes him behave.
Resolution
Garden gives Mary something to love and care for.
Dikon and Martha become Mary's friends.
They teach Colin how awful to be self-centered.

Concept Maps help students meet
Science Standards

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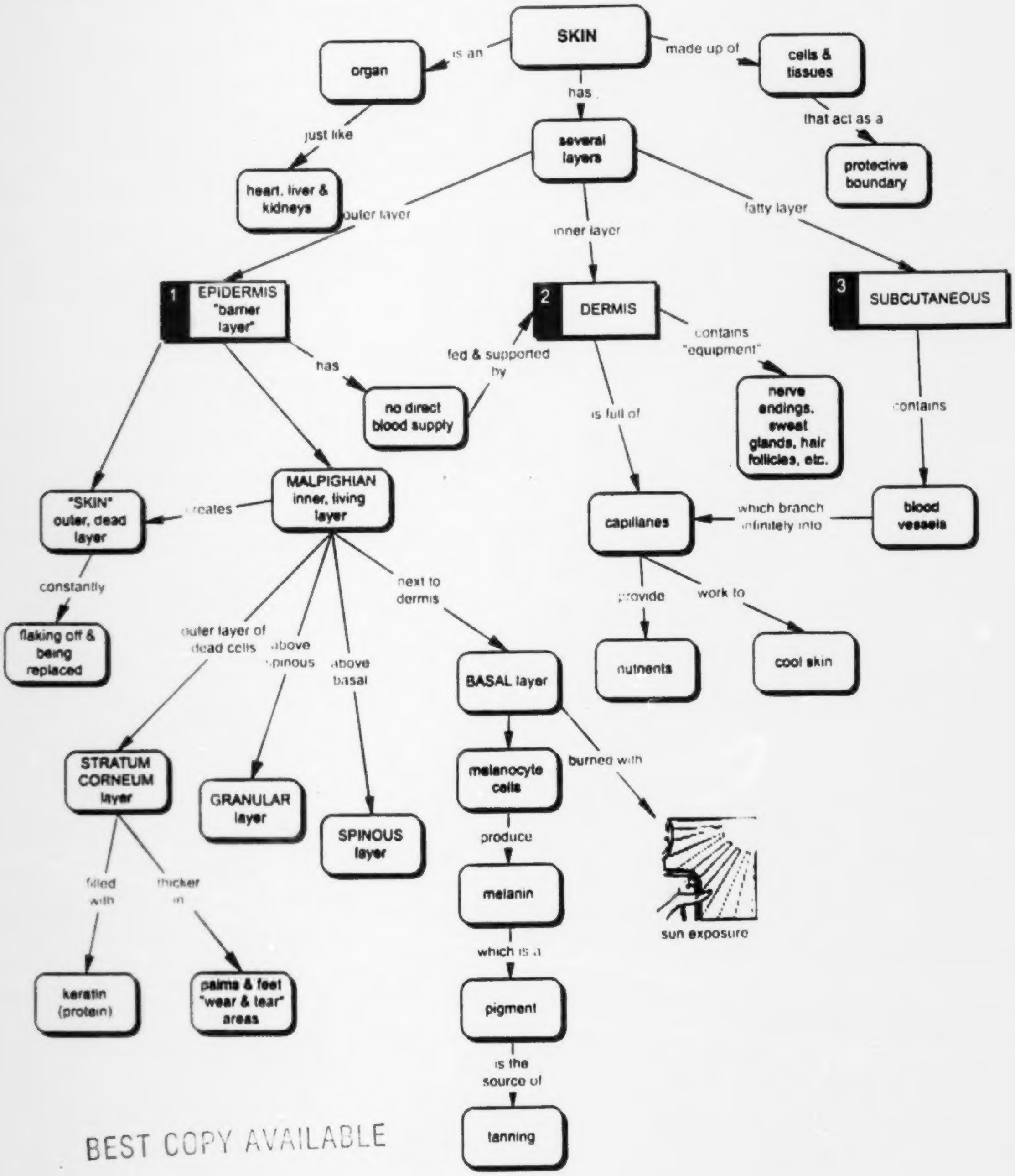
SKIN
is an
organ
just like
heart, liver & kidneys
made up of
cells & tissues
that act as a
protective boundary
has
several layers
outer layer
inner layer
fatty layer
1 EPIDERMIS "barrier layer"
2 DERMIS
3 SUBCUTANEOUS
has
no direct blood supply
fed & supported by
contains "equipment"
nerve endings, sweat glands, hair follicles, etc.
is full of
contains
capillaries
which branch infinitely into
blood vessels
provide
nutrients
work to
cool skin
"SKIN" outer, dead layer
creates
MALPIGHIAN inner, living layer
constantly
flaking off & being replaced
outer layer of dead cells
above spinous
above basal
next to dermis
STRATUM CORNEUM layer
GRANULAR layer
SPINOUS layer
BASAL layer
filled with
thicker in
keratin (protein)
palms & feet "wear & tear" areas
melanocyte cells
burned with
sun exposure
produce
melanin
which is a
pigment
is the source of
tanning

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Concept Maps help students meet
Social Science Standards

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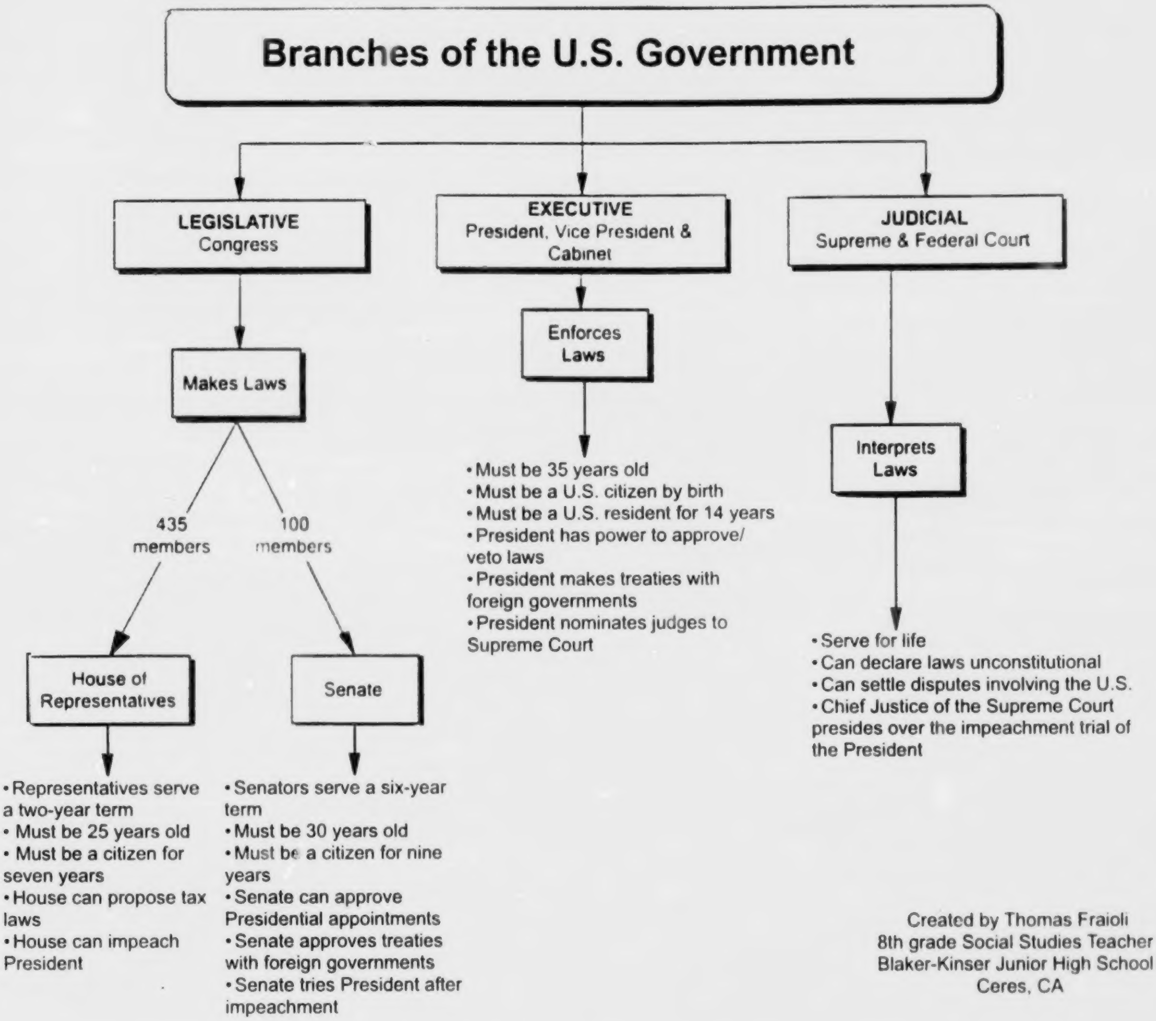
Branches of the U.S. Government
LEGISLATIVE
Congress
EXECUTIVE
President, Vice President & Cabinet
JUDICIAL
Supreme & Federal Court
Makes Laws
Enforces Laws
Interprets Laws
435 members
100 members
House of Representatives
Senate

- Must be 35 years old
- Must be a U.S. citizen by birth
- Must be a U.S. resident for 14 years
- President has power to approve/veto laws
- President makes treaties with foreign governments
- President nominates judges to Supreme Court

- Serve for life
- Can declare laws unconstitutional
- Can settle disputes involving the U.S.
- Chief Justice of the Supreme Court presides over the impeachment trial of the President

- Representatives serve a two-year term
- Must be 25 years old
- Must be a citizen for seven years
- House can propose tax laws
- House can impeach President

- Senators serve a six-year term
- Must be 30 years old
- Must be a citizen for nine years
- Senate can approve Presidential appointments
- Senate approves treaties with foreign governments
- Senate tries President after impeachment

Created by Thomas Fraioli
8th grade Social Studies Teacher
Blaker-Kinser Junior High School
Ceres, CA

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NatureShift!

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Linking Learning to Life: Model, Tools and Strategies Linking Electronic and Real Communities

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Memories & Stories **Robot Lab** **Wounded Hawk** **Ranger Rosie** **Dakota Skies**

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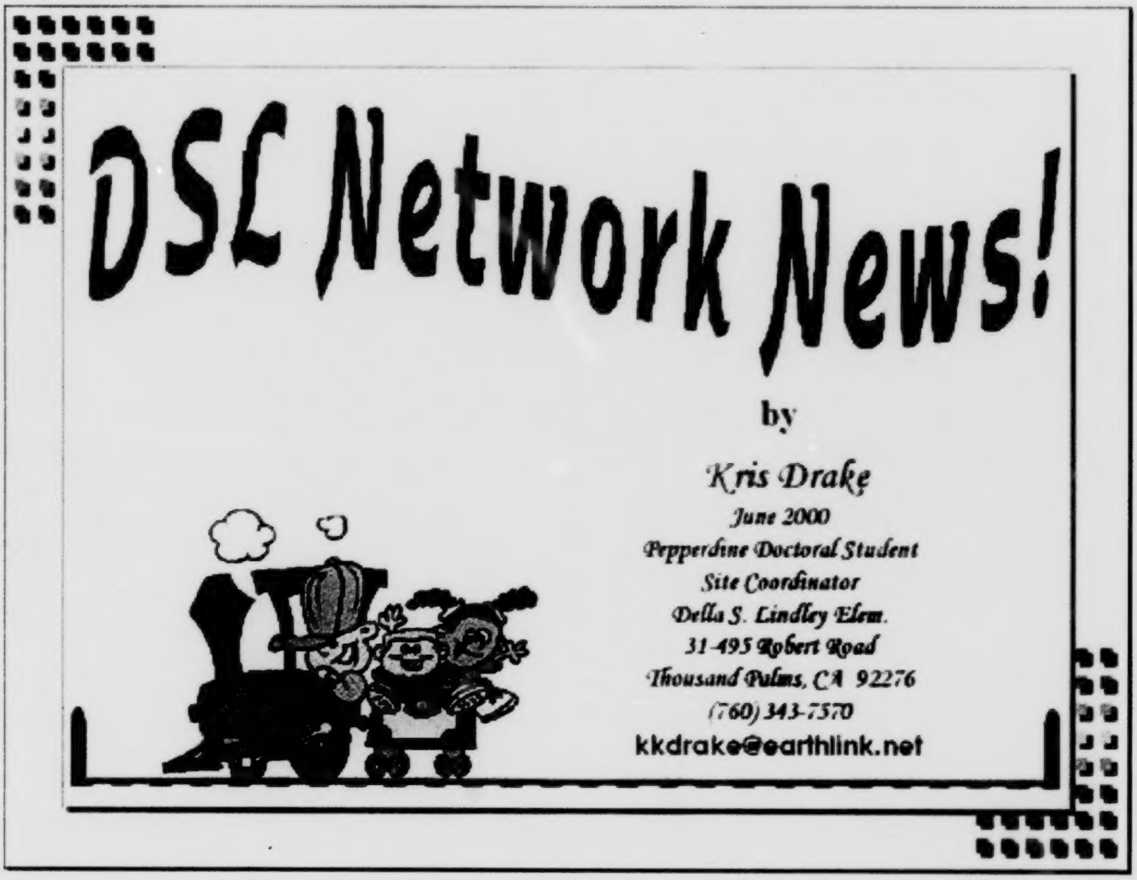

DSL Network News!

by

Kris Drake

June 2000

Pepperdine Doctoral Student

Site Coordinator

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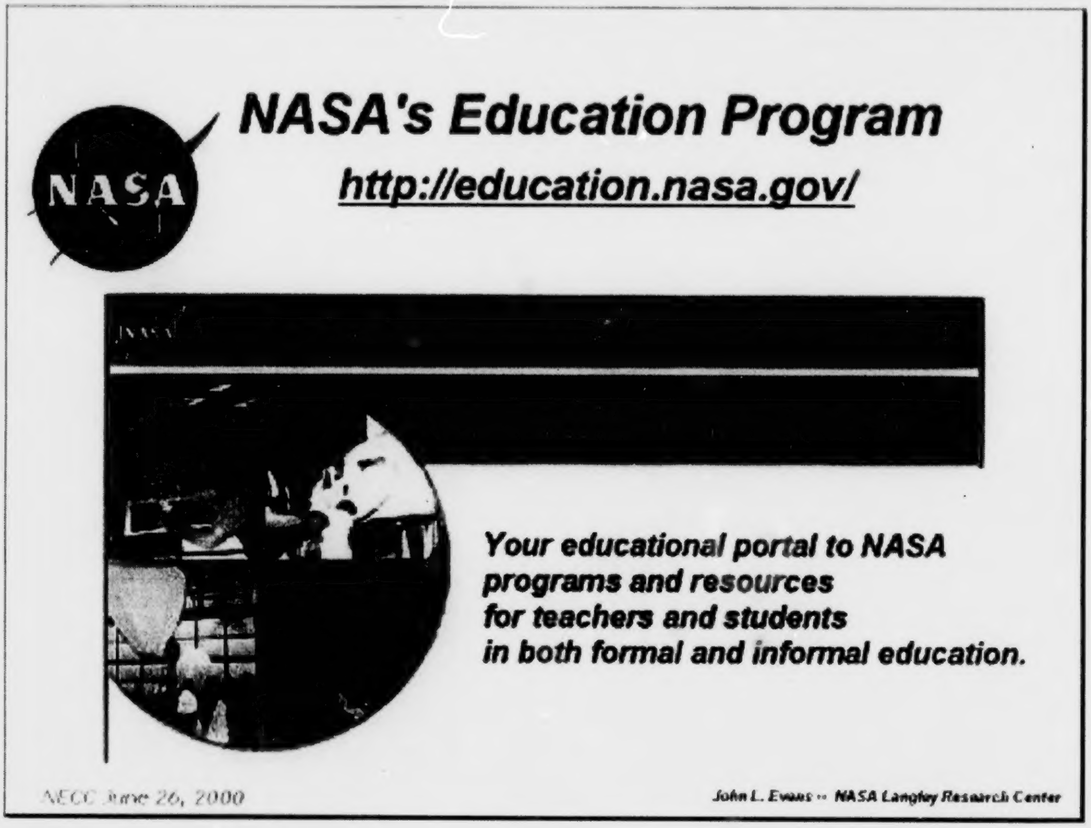

NASA's Education Program

http://education.nasa.gov/

Your educational portal to NASA programs and resources for teachers and students in both formal and informal education.

NECC June 26, 2000

John L. Evans -- NASA Langley Research Center

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Beyond Standards: What We are Learning from Conduction TechAudits
Technology Management Audits: A New Service to School Districts
Original Author Submissions

Johnson, Kirsten

Online Learning for Teachers and Students - Agenda
Designing, Implementing, and Assessing Online Courses
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Johnson, Larry

42eXplore: An Approach to Internet Integration (pdf format)
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Bridging the Digital Divide
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Krueger, Keith

Improving Teaching and Learning Through Technology at the Campus Level
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Online Interactive Lessons: Tools & Training
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Nature Shift! Linking Learning to Life - Sandwich Bot (pdf format)

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Case Studies
LT3 - Minigrant Evaluation
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Grow What you Know with Web-and-Flow
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Step-by-Step Directions for Creating a Web Page using the Wizard in Netscape Communicator
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Survey of Beliefs, Understanding and use of Technology I
Survey of Beliefs, Understanding and use of Technology II
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Students Gain Real-life Experience at Internet Stock Market Simulation
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Setting Up & Maintaining A Web Server for the Novice

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Identifying Some of the Best IT Projects in the US
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Fear of Writing Papers? Overcome Fear With the "Write" Strategies and Tools
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Norris, Toni

Resources to "Tear Down the Walls"
Tearing Down the Walls, Taking Teacher Training to New Heights
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Nye, Sharyl

Promoting Professional Development On-line
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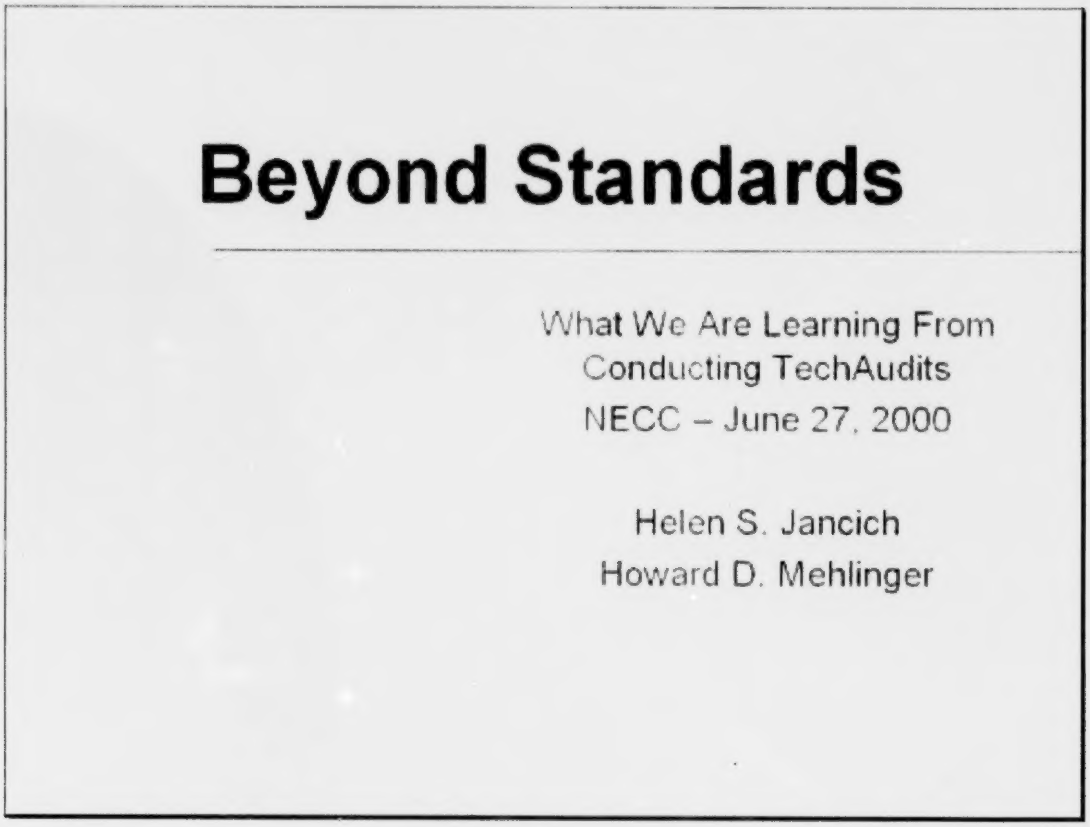

Beyond Standards

What We Are Learning From
Conducting TechAudits
NECC – June 27, 2000

Helen S. Jancich
Howard D. Mehlinger

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Technology Management Audits

A New Service to School Districts

Helen Siukola Jancich and Howard Mehlinger

What Is a Technology Management Audit?

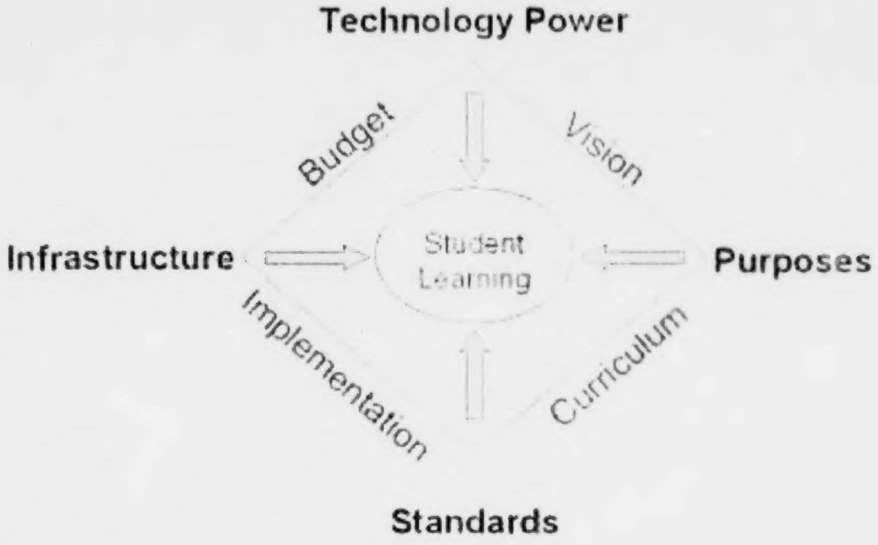
Technology Management Audits (TMA) are intended to assess all aspects of technology use in a school district. A TMA, conducted by an expert team of outside auditors, is a district-level examination of the alignment of educational purposes, technological power, infrastructure, and standards. The audit team reviews documents and survey results and makes on-site visits to conduct interviews and visit schools in order to answer specific technology-related questions. Auditors are responsible for creating and presenting the final audit report and the accompanying recommendations. Audit results can be used to guide future technology efforts in the school district.

Why Do a Technology Management Audit?

School systems have invested a great deal of money and resources in technology. Public officials, business leaders, and parents have high expectations for technology's impact on schooling. Also, technology changes rapidly, making existing plans obsolete. Yet, in most districts there are few individuals who have a comprehensive view of how technology is used. Furthermore, some technology-related problems are difficult to solve without external help. Outside auditors can help because they have no investment in past decisions or future actions, they bring a broad perspective to bear, they are able to gather information swiftly, and they are dispassionate in their analysis of that information.

What Questions Are Addressed in a Technology Management Audit?

Technology Management Audits are comprehensive by their nature and focus ultimately on student learning. Technology is viewed as part of a dynamic school system in which each element affects the others. In an audit it is therefore necessary to pay attention to all the elements of the system. An audit typically analyzes technology use on four levels:



Purposes: What is your district striving to accomplish with technology? Is technology being used for such purposes as learning, teaching, management, communications, curriculum enhancement? How well does the technology you have chosen fit that mission?
Powers of Technology: Do all decision makers, teachers, and other staff members understand the power of technology in education? Do they understand the capacity of technology to compute, analyze, store, show, and recall information; to alter the use of time; and to inspire and empower the user? How well are those powers being harnessed in your district?
Infrastructure: Does the structure and operation of your school district enable you to realize the maximum benefit from technology? How well are personnel, equipment and networks, software, technical support, and information resources being utilized?
Standards: What role do standards - such as ISTE Standards for Students and Teachers, CEO Forum STaR Charts, and applicable state standards - play in planning? Is there an alignment between these standards and what actually occurs in the schools?

A Technology Management Audit will also concentrate time and attention on specific issues that are worrisome to you. For example, you may be concerned about whether your district has good technology policies, or adequate personnel to manage technology, or a system for coping with rapid obsolescence, or a productive approach to staff development, or a public that doesn't understand what technology means to school districts. Perhaps you are anticipating a future technology planning effort, a bond issue for technology, or a campaign of grant-writing, and you want to challenge your staff to think beyond and outside of its present experience.

Who Does a Technology Management Audit?

The TMA team includes a lead auditor who serves as the point of contact with your district, plans the audit with you, assembles and leads the team, and prepares and delivers the final report. The team also includes at least three other auditors, depending on the size of the district. These auditors, who provide a fresh perspective on your situation, have extensive experience with technology and education, including both K-12 schools and college and university settings. They are former teachers, technology coordinators, superintendents, and other administrators, as well as experts in software and network design, evaluation, teacher education, and technology funding. None of these people has a vested interest in the past or future of what your district does. The audit team might also include interns.

What Is Involved in Doing a Technology Management Audit?

The process begins with a meeting (on-site and/or by phone) with a lead auditor who will review with you the rationale for an audit, the details of the process, and logistical issues related to the on-site visit. The lead auditor will also want to know what important issues lie behind your need for a TMA. From such a conversation will come a detailed plan for an audit.

Next, you will be asked to gather reports and documents about the use of technology in your district and to administer a districtwide survey to teachers and students. Surveys should be conducted at least two weeks - and preferably four weeks - prior to the audit team's visit. The survey is developed and the results are analyzed by the Survey Research Center at Indiana University. The survey results are interpreted by TMA staff before the on-site visit.

A five-day on-site visit by the audit team follows. The auditors review the documents and reports collected, visit classrooms and technology labs, and conduct interviews with staff and faculty. You will want the audit team to visit during a week when visitors will least disrupt your district and when they will see your district in normal operation. Also, you should choose a week when all key personnel can be present during the first few days of the audit. Having more than one possible week in mind will facilitate scheduling.

After data are collected and analyzed, the lead auditor writes a draft report, shares it with the district for feedback, revises the report based on that feedback, and presents the final report to the district. The report consists of an executive summary, observations, recommendations, and appendices containing survey results, among other materials. Pictures, taken on-site, are used to illustrate key points.

What Do We Need to Do to Prepare for an Audit?

Once your district has accepted a TMA proposal, the lead auditor will ask you to collect reports and documents related to technology use in your district. You will also be asked to administer a survey to a sample of faculty and students. Finally, you will be asked to identify faculty and staff to be interviewed during the site visit and arrange for their interviews.

A Technology Management Audit is a serious investment of your district's time and effort. It will be of most use if all goes smoothly. Typically, a school system will designate a senior official - perhaps a technology director, curriculum director, or business official - to be the liaison to the audit team.

How Long Does It Take to Complete an Audit?

An audit is normally completed in about two months - from initial contact to the delivery of the final report. The five-day, on-site visit can be scheduled as soon as the audit proposal is accepted by the district. Drafts and final versions of written reports are completed not more than one month after the site visit.

How Much Does an Audit Cost?

Technology Management Audits are customized to meet the needs of the individual client. The exact cost will depend upon the size of the school district, which affects the amount of time needed to analyze data and the number of auditors required to conduct the audit. Thus an audit for a typical school district consisting of eight elementary schools, three middle schools, one high school, and 10,000 students would cost in the range of $40,000 to $45,000. The price of an audit covers personnel expenses, travel, equipment, survey analysis costs, and the cost of producing the final report.

Districts can pay for audits from many sources. Consider not only school district budgets but also grants you have received; approach local foundations or businesses that have an interest in your school district; tap into state monies available for planning or evaluation.

Want to Learn More?

For more information, contact:

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ONLINE LEARNING FOR TEACHERS AND STUDENTS
NECC '00, Atlanta, GA

Agenda

I. Introductions and Overview (20 min)

II. Web-Based Curriculum

. Overview and Purpose of Web-Based Curriculum (20 min)
B. Group Investigation Activity: Use of Primary Resources, Online Expeditions, and Online Collaborative Projects (50 min)
C. Online Tool Demonstrations (30 min)
D. Hands-On Curriculum Development (60 min)

Lunch (60 min)

III. Online Professional Development

. Overview of Online Professional Development (30 min)
B. Group Activity: Designing Curriculum for the Online Environment (30 min)
C. Group Investigation: Threaded Discussion Tools and Techniques (30 min)
D. Strategies for Online Facilitation (30 min)
E. Examples of Online Professional Development Workshops (60 min)

Kirsten Johnson, Barbara Treacy, Susie Metrick

Center for Online Professional Education
Education Development Center, Inc., (EDC)
Newton, Massachusetts

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Online Learning for Teachers and Students, NECC '00

Kirsten Johnson, Barbara Treacy, Susie Metrick
Education Development Center, Inc. (EDC)

Designing, Implementing, and Assessing Online Courses

When you are designing, implementing, and assessing an online course, you follow similar principles and procedures as you would if you were working on a face-to-face course. This handout walks through the main steps in this process, highlighting recommendations specific to the online medium.

We have organized our recommendations into five broad categories-audience, topic, curriculum, facilitation strategy, and assessment. These categories are strongly inter-related, and must be considered in relation to each other. For example, when you plan your workshop, you will do well to think simultaneously about the audience and the topic they wish to investigate. We encourage you to also consider each category separately; such an exercise teases apart each strand of your thinking and clarifies your choices.

Finally, our recommendations pertain specifically to the type of online course with which we are experienced-a course in which interesting materials or investigations provide a starting place for professional participants to exchange views and strategies. While the course curriculum and facilitator scaffold and guide the learning experience, in our courses the learners are teachers (and vice versa), and their discussions provide the primary learning arena. This type of course is patterned after a graduate seminar format, rather than a lecture course or self-paced tutorial.

Guiding Questions

1) *Who is your audience?*
2) *What is your topic?*
3) *What is your curriculum?*
4) *What is your facilitation strategy?*
5) *What is your assessment strategy?*

1) Recommendations for defining and understanding an audience

- There should be some special benefit to your audience in taking the course online rather than face-to-face, due to time and/or distance constraints.
- Explicitly specify a common set of desired outcomes. Clarity about common outcomes is even more important in the online medium than in face-to-face situations.

- The detail with which you define your audience is very important online. This detail informs your topic selection, curriculum design, and instructional strategies, and helps ensure that they satisfy your participants' expectations well enough to counterbalance the gaps of distance and time across which you will work. For example, you will want to know:
    . What are your audience's goals? By "goals" we mean desired outcomes that they've stated explicitly. For example, a good definition of an audience goal might be "to learn how to use web-based resources in the middle-school classroom."
    b. What are your audience's needs? By "needs", we mean unstated requirements. For example, the audience will need to learn how to be comfortable using the web.
    c. What are their competencies and learning styles?
    d. What is their access to the technology they will need for your course, and how comfortable are they with it?
    e. How much time do they have available?
    f. What is their timeline? At what point during the school year will they need the information? At what point do you expect that they will be able to take the course?

2) Recommendations for defining a topic

- Assuming your goal is to take advantage of connecting people for discussion, (rather than simply to deliver rote content), then a successful topic will profit by reflection, exploration, brainstorming, and sharing.
- The web is a "cool" medium, so a "hot" or provocative topic will be most successful at engaging the audience to participate actively.
- The topic is amenable to a lag in response time. Pacing in an online course is slower than in face-to-face situations.
- The topic can be broken into specific outcomes that can be achieved in a limited amount of time.
- Define your topic in detail in order to make sure it will suit your audience, and also to inform your curriculum design, and instructional and assessment strategies.
  For example, you will want to know:
    . What outcomes are you trying to achieve?
    b. To achieve these outcomes, what components (subject matter, tasks) do you need to cover?
    c. For each task, what is your objective, and how will you know you are successful?

Checkpoint Question

When you compare your audience's desired outcomes with what you want to teach, is there something for everyone?

3) Recommendations for developing your curriculum

Keep in mind that the web medium shapes content in specific ways. What works in other formats may not work well on the web.

- Due to the cool medium of the web, design assignments to actively engage participants. For example, fuel discussions by framing provocative questions, drawing on case examples, using collaborative activities, engaging in explorations, and encouraging sharing of ideas.
- Frame assignments in small, clear chunks.
- Include "we are all together" moments to segue from one chunk to the next. (Strategies for doing this are discussed under facilitation strategies.)
- Frame sessions so that they can survive and even benefit from a lag in response time; accommodate the fact that participants work at their own paces, and will be at different parts of the assignments during the same time period.
- Take advantage of web-based tools and resources.
- Make sure activities are technically feasible for your audience, and provide necessary technical support.
- Abide by guidelines of good web design and navigation. The goal is to provide a seamless and intuitive learning environment, where participants will not feel inhibited or hampered by the medium.

4) Recommended facilitation strategies

Online course facilitators, like classroom teachers, play a variety of roles. In the online medium, it is possible to divide the roles among several people. Whether or not there will be one or more people responsible for the online course, it is helpful to consider all of the various roles and strategies that go into successful online facilitation.

Facilitator Roles	**Strategies**
Greeter, encourager. Make everyone feel heard. Create a comfortable environment.	• Publicly respond to each person's messages in the beginning of the course. After everyone is comfortable, responses can become more global. • Show your personality, so people feel like they know you. • Respond to initial introductions using them as a springboard for discussion. • Use bios, photos, introductions, emoticons (gestures represented via text), and an informal and friendly tone.

Foster communication between and among the participants.	• Phrase responses to encourage further responses from participants, and draw connections between participants' comments. • Avoid "over-facilitating", i.e., don't answer every question and settle every point so there is nothing for anyone else to say. If you respond to one question, push the discussion forward by raising another.
Provide behind-the-scenes support via email.	Email is a good way to respond to individual problems, or to prod people into participating without embarrassing them. If participants start saying interesting content-related comments via email, encourage them to post it to the discussion as well.
Model accepted interactions for participants.	• Pay attention to the tone of messages that you post, as a way of setting the workshop tone globally. • Being inclusive and making connections between participants' comments will model this type of discussion for the participants as well.
Keep the workshop alive; prevent stagnancy.	• Post "acknowledgement" messages to participants' comments, even if you don't have anything fancy to contribute on that point. • Be aware of time-participants don't check the discussions as frequently as we do. Don't let the lulls last too long though. If you keep the discussion alive, this is an incentive for participants to check more frequently. • The facilitator, or at least one member of a team of facilitators, must read and contribute to the discussion every other day (minimum). • Keep the majority of all communication in the public forum. Do not dilute the discussions with too much one-on-one email with participants.

Keep the discussions on track. Rein in long digressions. Push people forward on the topic.	● Act as a parabola, reflecting the energy back towards a central focal point. ● Be creative with limited tools for getting people's attention. Use subtle/humorous messages, or perhaps a humorous graphic/photo. Send personal email if necessary.
Guide participants through the curriculum.	Provide "we are all together" moments, such as: ● collaborative, consensus-building activities ● discussion summaries ● email messages that provide closure and thanks for previous session, and introduce and provide encouragement for next assignment ● surveys ● synchronous sessions
Make sure the audience and the curriculum are in sync.	● Observe participants' behavior and responses to assignments, and adjust facilitation strategies and/or curriculum content and presentation as necessary. ● Encourage participants to explicitly reflect on the course experience and provide feedback (either in the online discussions or via email to the facilitator).

5) Recommended assessment strategies

- To measure whether you have reached your stated goals, it is useful to survey your participants with the same questions both pre- and post-workshop. You can use web-based survey forms to collect this information.
- Ask questions that can inform your future designs.
- Do follow-up inquiries to look for changes in behavior, attitude, usage, and practice. Email is a convenient method for doing this from a distance.
- Consider doing a detailed analysis of the stored messages that remain available after the course. (For example, you can look at quantitative data such as the number of messages posted by individuals, frequency of participation, and number of levels of responses within particular conversations. You can also look at qualitative information, such as the nature of the discussions, what common themes emerged, how participants related to each other and to the course content, etc.)
- In the last week of the course, invite participants to post messages reflecting on their experiences in the course and what they have learned, and to discuss what they plan to do next.

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Online Learning for Teachers and Students, NECC '00

Kirsten Johnson, Barbara Treacy, Susie Metrick
Education Development Center, Inc. (EDC)

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Archives of Leadership and the New Technologies (LNT) Online Workshops

The Leadership and the New Technologies (LNT) project, run by Education Development Center, Inc., has led several online workshops for education leaders on topics concerning the integration of technology into K-12 education. To view the archives of some of the LNT workshops, go to http://www.edc.org/LNT/workshop.htm

42eXplore: *An Approach to Internet Integration*

http://eduscapes.com
Annette Lamb alamb@eduscapes.com
Larry Johnson ljohnson@mail.escapees.com

- Foundation of Info
  - Sturdy chairs need 3 legs.
  - You need 3 good resources for a foundation of information.
- 42eXplore: You need four to explore!
- Project Overview
  - Goal: encourage life-long learning
    support classroom teachers
  - Target Age: everyone
  - Topics: interest, popular k12, requests
  - Postings: each Monday
- Contents
  - Easy & Harder Description
  - 4 Starters Activities
  - Additional Web Resources
  - Word List and Links
  - Indexes: Subject, Date

http://eduscapes.com
http://memory.loc.gov/ammem/fsowhome.html
http://www.plainfield.k12.in.us/hschool/webq/webq1/webquest.htm
http://lcweb2.loc.gov/wpaintro/wpahome.html
http://www.pbs.org/wgbh/amex/dustbowl/
http://www.escape.com/~paulg53/politics/great_depression.shtml
http://newdeal.feri.org/
http://www.museum.siu.edu/museum/Museum_Explorers/school_pages/bourbonnais/index.htm
http://www.education-world.com/a_lesson/lesson147.shtml
http://www.cccalumni.org/history1.html

- Locate Websites
  - Search Tools for children, for adults

http://www.rcls.org/ksearch.htm
http://www.rcls.org/search.htm

- Select Materials
  - Choose based on:
  - Content Quality Readability
  - Varied info channels Multiple Perspectives

http://eduscapes.com/42explore/smplmac.htm
http://sln.fi.edu/qa97/spotlight3/spotlight3.html
http://www.science-tech.nmstc.ca/engine.cfm?function=link&idx=1394&language=english#simple
http://www.galaxy.net:80/~k12/machines/gears1.shtml

- Organize Resources
  - Starting Points and Link Sites
  - References and Information
  - Learning Tools & Activities: WebQuests
  - By Kids, for Kids
  - By Teachers, for Teachers

http://eduscapes.com/42explore/poetry.htm
http://www.poetry4kids.com/links.html
http://www.gigglepoetry.com/
http://www.bordentown.k12.nj.us/mjs/Mr.%20O/pwebq.html
http://www.link.cs.cmu.edu/dougb/rhyme-doc.html
http://7vsweekly.freeservers.com/
http://www.geocities.com/EnchantedForest/5165/index1.html
http://www.iron.k12.ut.us/schools/cms/resource/Welco.htm

- Build Activities
  - Start with outcomes
  - Then, build: questions applications
    webquest project guides

http://eduscapes.com/42explore/teslatn.htm
http://www.WorldOfEscher.com/gallery/
http://penn.phm.k12.in.us/Math-Science/New_Folder/final.html
http://forum.swarthmore.edu/sum95/suzanne/tess.intro.html
http://www.best.com/~ejad/java/patterns/patterns_j.shtml
http://library.thinkquest.org/16661/index2.html

- Set the Stage
  - Guide learning: worksheets, diagrams
  - Transform information: write, draw, discuss
  - Share ideas: email, bulletin boards
- Things to avoid - Don't…
  - copy URLs by hand give too many options
  - expect miracles waste time surfing
- Things to do
  - Review the 42eXplore archives
  - Check 42eXplore weekly
  - Keep it simple Focus on specific pages
  - Match activities & outcomes

Click to open author's original document.

Bridging the Digital Divide

Learn how technology and telecommunications are used to meet the needs of diverse learners in remote locations. Hawaii's E-School has leveraged the playing field to provide equity and excellence to students anytime from anywhere by developing virtual credit standards-based courses for teachers and students. The presenters will share their successes and challenges in offering educational opportunities to students in rural settings.

Abstract

Learn how technology and telecommunications are used to meet the needs of diverse learners in remote locations. Hawaii's E-School has leveraged the technology infrastructure, recycled computers, developed online staff development and online high school courses to provide equity and excellence to students anytime from anywhere. This presentation will focus on the key ingredients in developing virtual credit standards-based courses for teachers and students. The presenters will share their successes and challenges in offering educational opportunities to students in rural settings.

The Hawaii Department of Education (HDOE) Electronic School (E-School) is a virtual school that offers high school credit courses to students through the use of multimedia technologies and the Internet. E-School breaks down the walls of the traditional classrooms and makes quality instruction available to students at more convenient times and more accessible places - "any place, any time, for everyone!"

In 1996, Hawaii's public schools received a $4.7 million competitive grant for a five-year U.S. Department of Education Technology Innovative Challenge Grant to expand and enhance E-School. The major partners and contributors are Maui High Performance Computing Center (MHPCC) and Tech Corps Hawaii. Since its inception in 1996, E-School has developed 33 online courses.

The state-of-the-art HDOE telecommunication and technology infrastructure provide a technology perspective of the value of the infrastructure to the development and success of on-line courses. E-School includes both courses for students and a teacher education and in-service teacher training program.

E-School extends the traditional school schedule and expands awareness by including experiences from the community and the world. The project
accomplishes these changes based upon these goals:

- Promote challenging standards that assist statewide systemic reforms.
- Develop curricula and teaching strategies exportable to other settings and communities.
- Benefit students by integrating acquired technologies into curriculum to enhance teaching, training and student achievement.
- Offer intensive professional development for teachers and staff on use of technology in all learning environments.
- Develop new learning environments for disadvantaged and technologically undeserved students.
- Create high-quality educational technology applications and services that can be marketed to other communities.

Collaboration with businesses have expanded the dimensions of E-School offerings. E-School is a successful model that has created multiple partnerships

throughout the wider community. Over 50 corporations and educational programs have pledged their support in building this virtual school. This support
ranges from extended connectivity to schools, teacher training, and mentoring students to technical expertise in the areas of multimedia development.

E-School students come from varying geographic and economic backgrounds. Educationally disadvantaged students and technology underserved students have new educational opportunities. Using the interactive curricula, students have the ability to share their expertise and to explore in the learning process together, both locally and globally. Teachers facilitate the learning process and guide learners down pathways, working in a self-paced collaborative process.

Through the use of lecture/demonstration, participants will learn how Hawaii has drawn from various resouces in offering high school credit courses to all students throughout Hawaii. They will take away ideas of a successful electronic, virtual model.

Urls:
Advanced Technology Research: atr.k12.hi.us
E-School: www.eschool.k12.hi.us
Magnet E-Academy: e-academy.k12.hi.us
Technology & Telecommunications for Teachers: www.k12.hi.us/~tethree
Technology Literacy Challenge Fund Summer Institute: www.k12.hi.us/~tlcf

Presenters:
Vicki Kajioka is an Educational Specialist with the Hawaii Department of Education. She is the Director of E-School, Hawaii's Electronic School, which provides on-line and web-based courses for secondary school students and staff development for teachers. Vicki is also a member of the TechCorps Hawaii Board of Directors.

Donna Min Shiroma is a Resource Teacher with the Hawaii Department of Education, Advanced Technology Research. She coordinates the Technology Literacy Challenge Fund Summer Institute Workshops for teachers and is an instructor in the Technology and Telecommunications for Teachers program sponsored by the HI DOE.

Click to open author's original document.

Improving Teaching and Learning Through Technology at the Campus Level

This NECC workshop is being offered as a preview of a one-day workshop offered by the Consortium for School Networking (CoSN) to assist building-level decisionmakers strengthen educational technology programs and planning. The actual training products and session, to be offered beginning in the Fall of 2000, and titled *New and Emerging Competencies for Building-Level Technology Champions*, was developed by CoSN, with support from BellSouth Foundation. Workshops will be presented to building-level technology decisionmakers and teams-principals, media specialists, campus technology coordinators, and others involved in campus-level planning for effective use of technology.

Focus, training objectives, and workshop deliverables:

Increasingly, accountability for technology purchasing, planning, and assessment is a major responsibility of school building-level administrators. District administrators, school boards, and communities have an investment, and therefore an interest, in technology utilization at individual campuses. While these district administrators focus on certain issues and functions that impact all campuses, there remains a significant role and responsibility that individual schools have for technology planning.

The primary objectives of the workshop are to help building-level technology decisionmakers and teams:

- to consider critical issues
- to locate resource information regarding technology use
- to develop new strategies for promoting effective use of technology in their school's classrooms

The components of the workshop include:

- Day-long training session
  - morning presentation on the following topics:
    Linking Technology to Educational Goals
    Budgeting: Taking Total Cost of Ownership (TCO) to the Classroom
    Successful Models: How the E-rate Is Being Used As a Catalyst for Technology Planning
    Measuring Success: How Will We Know When We Get There?
  - afternoon small group roundtable discussions
- Participant Workbook
  - narrative overview of each topic
  - copies of trainer's PowerPoint presentation slides
  - URL Resource List for each topic
  - additional resources

Overview of the key discussion topics to be addressed in the workshop:

Linking Technology to Educational Goals

Across our districts and campuses, in a myriad of settings and conditions, we can cite instances of how technology is changing teaching and learning-just as it is changing homes and businesses in our community and beyond. Many educators believe in the benefits of technology, but education has been somewhat remiss in gathering data needed to validate and improve on technology-based programs as well as in changing the culture of the school campus and classroom. The good news: there is a growing body of research studies now pointing to the effectiveness of technology use in schools.

Technology is helping teachers design effective learning activities that are more student-centered. Educators sometimes refer to this as moving from being a "sage on the stage" to a "guide on the side". As a "guide on the side", the teacher can combine more traditional teacher-centered activities with student-centered ones that allow for more active and engaged learning opportunities.

At the forefront of our minds must be a continuous emphasis on ensuring that the benefits of technology are within the reach of all of students and teachers. This requires thoughtful planning and policy in states and districts-and on individual campuses.

Discussion will address:

- student achievement
- educational equity
- workforce preparedness
- challenges for schools to address

Budgeting: Taking Total Cost of Ownership (TCO) to the Classroom

In what some might now call the " good old days", schools purchased computer equipment with a variety of funding sources, including not only district budgets, but also PTO money, bake sales, and cashed in soup labels-your school may still be using some of these strategies! Sometimes equipment was donated by community businesses or parents, though it was rarely state-of-the-art, latest-and-greatest technology.

It was the job of a technology coordinator (or more likely someone with technology responsibility, often in addition to teaching or other duties) to refurbish, repair, cannibalize and do whatever necessary to get the machines into service and keep them working.

After some number of years of this practice, schools began to acknowledge that this resulted in chaos, with a jumbled array of hardware, no standards for software, compatibility problems, and more.

Unfortunately, as schools juggle with existing budgets while trying to grow technology plans, this practice continues on some campuses.

A legendary figure in educational technology, LeRoy Finkel, wrote an article some years ago titled, "When Schools Cannot Afford to Accept Contributions of Computer Equipment". His main point was that when the resources required to maintain equipment donations were significantly out of proportion to the instructional benefits of using them, then the gift should not be accepted.

While this may not seem so astounding today, at the time it was a conceptual breakthrough for schools, many of whom were so hungry for computer technology that they would take anything offered to them. Finkel's article was surely a forerunner of the concept of Total Cost of Ownership (TCO) of technology in schools.

Discussion will address:

- what total cost of ownership means
- costs *beyond* the purchase of hardware
- determining where your campus is with TCO-and where it should be

Successful Models: How the E-rate Is Being Used As a Catalyst for Technology Planning

The Universal Service Fund (USF) for schools and libraries, or as we have come to more commonly know it-the E-rate-is a federal initiative that provides significant discounts on telecommunications and Internet technologies to K-12 schools and public libraries in the U.S. The E-rate discount program was authorized by Congress as part of the Telecommunications Act of 1996 and signed into law in February, 1996. The law left the details of the program to the Federal Communications Commission (FCC), which inaugurated the program in May, 1997.

Funded at up to $2.25 billion annually, the program provides discounts on telecommunication services, Internet access and internal connections for eligible schools and libraries in the United States. The Schools and Libraries Division (SLD) of the Universal Service Administrative Company (USAC) is responsible for administering the E-rate program through an application process.

Some would tell stories over the two-year history of the program of struggling through the application process, working feverishly to meet deadlines, and being frustrated by delays. But when all is said and done, the E-rate program is making a difference in the availability of technology to many of this nation's children. To date, thousands of schools and libraries from every state in the nation have participated in and benefited from the E-rate program.

Schools have always been eager to adopt technology, but prior to the E-rate many lacked funding to do so. The E-rate program is serving many schools and libraries across the nation and is benefiting entire communities by reaching remote and rural schools, large urban schools who lack resources, and small private schools.

Not only has the E-rate program changed many communities, but it is strongly supported by an overwhelming majority of Americans-a finding of a poll commissioned by members of the Education and Library Networks Coalition (EdLiNC).

On the other hand, getting a school wired is only the starting point-*not* the finish line. Once the hardware, wiring, and basic infrastructure are in place to allow for access, the *real* work begins: training, documenting progress, communicating results, and adapting plans as needed to meet ever-changing goals and needs.

Discussion will address:

- success stories from schools where use of E-rate funds is making a difference

- creating a broad plan and making your dollars count

Measuring Success: How Will We Know When We Get There?

In her adventures in Wonderland, Alice asked the Cheshire cat, "Would you tell me, please, which way I ought to go from here?"

"That depends a good deal on where you want to get to," said the Cat.

"I don't much care where…," said Alice.

"Then it doesn't matter which way you go," said the Cat.

And so it is with technology effectiveness on our campuses. If we don't have a plan in mind, it is difficult to know when we are making progress. And with today's significant focus on and monies invested in educational technology in our schools, it is no longer sufficient to be accountable only for the installation of hardware and connectivity. Educators and communities are asking, "And so…?"

Discussion will address:

- what we should be assessing
- planning for success
- research and evaluation findings to support evaluation of your plan
- what teachers should be accountable for-and how administrators should support them
- things to remember as you assess progress

Additional information about the CoSN workshop, *New and Emerging Competencies for Building-Level Technology Champions*, as well as a schedule for future workshops may be found by pointing your browser to the CoSN website at http://www.cosn.org (click on the Conferences and Workshops button) or by calling Toni Miller at 202-466-6296, x15.

Ringmasters, Clowns, & Tightropes:

Educational Technology Management and Leadership

Annette Lamb alamb@eduscapes.com
http://eduscapes.com

Clowning Around
We've got answers to the big questions!
- Correct, Incorrect, Silly

1 Learning

Do computers really make a difference in kids' learning?
- Yes, no, maybe… It depends what we want children to learn!

Communicating
- Word processor, Graphics, Email, Chat
- Phone, Speaking/Audio, Movement/Video

http://quest.arc.nasa.gov/women/intro.htm

Ask not what computers can do with children, but what children can do with computers.

http://teleeducation.nb.ca/nosignificantdifference/

Impact-NCET
- Flexibility to meet individual needs
- Reduce the risk of failure at school
- Present relevant information
- Motivate and stimulate learning
- Enhance special needs learning
- Encourage thinking & collaboration
- Promote "fresh" teaching

Impact - ACOT
- Enthusiasm & Collaboration
- Graduation Rate Increases
- Higher Ed Entry Increases
- Writing Increases
- Reduced Absentee Rates
- Basic Skill Learn Time Reduced
- Information Literacy Increases

http://fromnowon.org/

Impact: What are you measuring?
- Effectiveness, Efficiency, Appeal

Believers Unite
- Why are you a believer?
- Test scores, Anecdotes, Smiles
- How can you show nonbelievers?

2 Integration

What do you mean by the term "integration of the computer into the curriculum"?
- It's the opposite of segregation.
- Technology is a tool and resource that should be used as the learning need dictates.

Integration
- Ongoing Use, Regular Use, Project Use
- Teachable Moment
- Technology is transparent and interwoven like the voice, pencil, and books.

Inspiration
http://forum.swarthmore.edu/students/
http://www.digitaldog.com/

3 The Numbers

How many computers are enough?
- You need enough computers so that each student can access the technology, when it is needed.

http://parkscanada.pch.gc.ca/parks/main_e.htm

4 Expiration Dates

How do you handle aging technology in your schools?
- Develop a plan for retirement.
- Retire in phases.

If it's green, it's biology
- If it stinks, it's chemistry
- If it has numbers, it's math
- If it doesn't work, it's technology

Planning Options
- Living Technology Plan
- Cross Your Fingers & Prayer

Big Infusions
- Big Chunk Local/Area/Gov't
- Huge Grant
- Pros: Get lots of stuff
- Cons: When will you get it again?
- Doesn't lead to evolution

Chunks of Tech
- Pro: What you need, when you need it

Cons: When we get a grant, funding…
    We'll give it to squeaky wheels…
    Requires a good tech plan
Hand-Me Downs
  Buy constantly and shift equipment around
  Pros: Repurposing adds life
  Cons: Quiet people lose
  Repurpose equipment until it fades away over time.

5 Assessment

How do you assess the IT program within your school?
  What are your goals?
  How well are you reaching your goals?
  Look at your program from multiple perspectives
It said "Insert disk #3" but only two disks will fit in the little hole.
Press any key. Where's the any key?
Windows installation complete, press your luck to continue.
Wow!Look at the cool cup holder on my computer!
What's important?
Are students getting to the technology when they need it?
  Are teachers using the technology when it could be used?
  Are parents/community members happy with the results?
Assessment Tools
  Standards, Testing, Portfolios, Interviews, Surveys & Polls, Documentation, Data
Assessment Keys
  Be specific, Focus on a particular topic
  Keep it short, Try it before use
  Ask yourself:
    Why am I collecting this data?
    How will I use this data?
Make it work
  Require it faculty meetings, get tech, do paperwork
Enjoy it interesting, food, rewards

6 Future - Trends

What coming trends should technology leaders be aware of?
  Faster, cheaper, cooler, easier
  Equity, access, copyright issues
  Watch kids, television, mag, and techies
The future is that time when you'll wish you'd done what you aren't doing now.
  Anything is possible if you don't know what you are talking about.
  The true test of intelligence is not how much we know how to do, but how we behave when we don't know what to do.
    John Holt, How Children Fail
Visual Communication
  Video conferencing, Imaging, Animation, Digital video
http://www.gsn.org/cu/index.html
Authentic Projects
  Communicating, Writing, Imaging
  Real-world, data, experiences impact
http://www.ibiscom.com/
Collaborative Projects: Teachers, Students
  Get person shares, contributes, assesses
http://ftp2.vc.attjens.co.jp/vc_66/index2countdown.html

7 Implementation

How do you get other teachers on staff to commit to integrating technology into their classroom activities?
  Gifts, bribes, jealousy, threats OR
  Collaboration, sharing, support
There are two types of computer users:
  Those that back up their files and those that will one day be upset that they didn't.
  Provide Choices Do A Do B Do C
    There is no "none of the above".
Build Teams
  Burn the fire from both ends
  Groups of 3, Teachers & Students
  Administator & Teacher
Lend Support
  I'll post the projects, you get them to me
  I'll make the page, you send me URLs
  You take the pictures, I'll download them
  Drag Them Along
  Baby steps
  Repeated projects
  Think small
Every expert was once a beginner!

8 Culture

How do you build the technology culture in your school?
  Keep it simple Make it fun
  Make it a part of the day

Work as a team   Smile!
We believe that children are the future
We believe teachers shape their future...
We believe technology is cool
We believe teachers are cooler.
-Tom Snyder Productions

Start with Cool Projects
- Low "learn-time"
- Very little time
- Very little management
- High impact
- Real-world
- Make the curriculum fun!

http://www.clark.net/pub/cve/cveteeth.html

Share Cool Projects
- Reach Outside the Classroom
- Classroom or hall bulletin boards
- Library/lunchroom sharing
- School-wide activities
- Work across grades
- Share on the web!

http://members.aol.com/il2teach/pubpage.htm

Involve Everyone! Involve
- students in grant writing
- teachers in creating
- principals in judging
- parents in sharing

Build Fun Themes
- Schoolwide projects
- Logo contests
- Fund raising activities
- Lab/classroom fun:
- Beanie toppers, screen borders, mouse pads, mobiles

9 Motivation

How do you motivate teachers?
- Positive work environment
- Moral and technical support
- Praise
- Opportunities
- Early retirement incentives

The mediocre teacher tells
The good teacher explains
The superior teacher demonstrates
The great teacher inspires
William Arthur Ward

Untie Teachers
- Blocks of time to plan
- Chances to work with others
- Easy access to resources   Opportunities

Inspiration

Models	Mentors
Teaming	Ideas
Connections	Step-by-step Help

Hardware without software is just junk, but software without teaching is just noise.

Opportunities
- Teachers need lots of opportunities. Every teacher that takes an opportunity is a success
- Lists of ideas   Link to sites
- Cool examples

10 Dealing with Dips

How do you handle the implementation dip?
- Making it a habit
- Ongoing, supported projects
- Infusion of new ideas

Join Projects
- It's hard to quit once you get started.

http://k12science.stevens-tech.edu/curriculum/boilproj/index.html

Sharing Success
- Seeking out cool projects Each 1, teach 1
- Techie teacher in "convert pics"
- Highlight in newsletter

Mini Grants
- Support new ideas
- I just need...a digital camera, a field trip photo quality paper, a set of books a vacation???

Infusion Ideas
- I know the software, now what?
- Beyond PowerPoint
- Beyond HyperStudio
- Show examples

11 Configurations

What's the most effective way to configure computers in schools - singles, clusters, labs?
- Effective, efficient, or appealing?
- It depends on your students, teachers, building structure, and curriculum.

I can please only one person per day.
Today is not your day.
Tomorrow isn't looking good either.

Think Use
- One person, one computer
- Two people, one computer
- Small group, one computer
- Mixed, computer clusters

- Entire class, computer lab
- Entire class, projector

Think technology

Computers + scanners & digital cameras
- probes/lab equipment printers
- data projectors video cameras
- microphones

http://www.stolaf.edu/other/snap/cyberseasons.html

12 Role of Internet

What's the role of the Internet in schools?
- The Internet is a tool for information and communication.

Keep Current: Current events
- This day in history

http://www1.sympatico.ca/cgi-bin/on_this_day

Virtual Travel
- Armchair traveler
- Interactive field trips
- Simulated explorations

http://www.dreamscape.com/frankvad/tours.html
http://www.rims.k12.ca.us/iditarod/index.html
http://www.globalearn.com/
http://www.goodearth.com/virtcave.html

Multiple Perspectives
- Lumber Tobacco Exercise
- Cloning Guns Endangered Animals
- Recycling

Information
- You need snow to ski.
- You need data, resources, and tools to make decisions

http://www.gov.pe.ca:80/lucy/index.asp
http://scriptorium.lib.duke.edu/collections/african-american-women.html

Instruction
- Tutorials Practice
- Role Playing Simulations

http://www.japanese-online.com/

Communication
- Interacting online
  - other teachers other classrooms
  - other students parents
  - community experts

http://agcwww.bio.ns.ca/schools/classrm.html

Collaboration

http://earthdaybags.org/

Creation

http://thinkquest.org/
http://www.gsn.org/cf/index.htm
http://www.schoolnet.ca/home/e/index.html

Share & Reflect
- Drop in on other schools
- Provide an audience for learning

http://www.sd81.k12.wa.us/Regal/DishmanHills/56DHill.htm

Teacher Tool
- Search online: textbooks, television, software

http://www.teachtsp.com/classroom/timelineronline/tlineronline.html

13 Protection

How do we protect kids from inappropriate materials?
- Don't protect, prepare!
- Internet is a reflection of our society, good and bad

What's the Goal?
- Protecting children from
  - inappropriate materials
- Sheltering kids from "bad influences"
- Preparing kids for the "real world"
- Helping students make choices

14 Emphasis

Where do we put our emphasis - tool-based software or curriculum-based software?
- Let's emphasize learning.
- What tools and resources will
  - engage learners?

Are we trying to turn out intelligent people, or test-takers?" John Holt, *How Children Fail*

Do It All!
- Make it meaningful Connect curriculum
- Focused Tutorials WebQuests
- Project-Based Learning

http://edweb.sdsu.edu/webquest/matrix.html

15 The Answers: Where can I find the answers?
- Look to each other

When you feel like you're losing it...
- ...email a peer

When you have too many things going…
- … ask for help.

When you're frustrated by the system…
- …remember this workshop and smile!

Microsoft has announced that the release of Office 2000 has been delayed until the second quarter of 1901.

Macintosh - we may not get everything right, but at least we knew the century was going to end. *Douglas Adams*

Classroom Campfires:
Don't Do Internet, Do Integrate!

Annette Lamb
alamb@eduscapes.com
http://eduscapes.com/activities/index.html

http://eduscapes.com/activities/index.html
Sparks
You need matches to start the fire and logs to keep it going
Web-Based Resources
http://www.sandiegozoo.org/special/pandas/panda_baby_intro.html
http://www.globalschoolhouse.org/pr/index.cfm
http://168.19.116.22/pse/tb/tb.html
Teacher Sparks
Good starting points
search tools for kids & adults
general starting points
teacher resource starters
Bookmark folders
Personal web page
http://www.rcls.org/search.htm
http://www.rcls.org/ksearch.htm
http://www.suite101.com/
http://tlc.ai.org/
http://www.gis.net/~peacewp/sear.htm
http://www.stemnet.nf.ca/CITE/themes.html
Sparks
What's your teaching area?
What do students need to learn?
What resources do you already have available?
In what areas could you use some additional information, examples, or excitement to build the learning environment?
http://www.nutritionexplorations.org/
Selecting Sparks
Pick 1 OR Pick 4 assure 3 resources
varied perspectives
multiple sources
varied channels
Consider the needs & interests
http://www.stampsonline.com/gallery/ctc.htm
http://www.achievement.org/galleryachieve.html
http://www.biography.com/
http://members.home.net/klanxner/lives/index.html
http://www.s9.com/biography/
http://library.advanced.org/10320/Stamps.htm
http://library.advanced.org/10320/Carver.htm
Your Mission: Go to the Subject Area Sparks
Consider grade level, entry skills
reading ability
Bookmark (or favorite) a site for easy reference.
Purpose
What's the purpose of your campfire?
Is it for warmth, to cook food, or simply for fun?
Question: Why are we making this campfire?
Learning Outcome
http://antoine.frostburg.edu/chem/senese/101/
Purpose
Draw students into web resources:
solve a problem
address an issue
answer a question
http://www.paducah.k12.ky.us/curriculum/webquests.htm
http://www.angelfire.com/wy/peacequest/
Learning Outcome
Identify a specific learning outcome.
What do you want your students to be able to do or talk about at the end of the activity?
Focus
It's not about Internet, the specific website, or even the subject area.
It's about learning a skill,
acquiring a concept,
or solving a problem that will
transfer to other learning
experiences down the road.
Outcomes
When identifying outcomes consider:
cognitive, social, affective, kinetic
metacognitive areas.

- Your Mission: Go to the Active Alternatives page.
  - Not: state, list, describe
  - Focus on higher-level, thought-provoking activities.
  - Share your active words and learning outcome with a peer.
- *http://www.chariho.k12.ri.us/curriculum/MISmart/ocean/sandhome.htm*
- Embers
  - Embers are the hot, glowing remains of a fire.
  - It's the time to put on the fry pan, roast the hot dogs, and make s'mores.
  - Don't just watch the fire, use it!
  - Engaging Learners
- Embers
  - Don't just read information off the Internet, use it!
  - Consider:
  - How you will activate the learning environment?
  - How will you engage students and keep them excited about learning?
- *http://www.pbs.org/ktca/americanphotography/*
- Introduction
  - Student with an overview
  - Provide background information
  - Draw student interest
    - picture or cartoon, quotation
    - statistic or problem
  - Hook your students
- *http://politicalgraveyard.com/index.html*
- Activity
  - Actively involve students in learning: explore, evaluate, organize, analyze, apply, solve, formulate, create, communicate
  - Let students paddle
- *http://www.gcse.com/Maths/pre.htm*
- Your Mission: Go to the Engaging Embers page.
  - Brainstorm some interesting products that students could create using the information found on the Internet.
- *http://cust3.iamerica.net/anyroddy/*
- Tools: Provide a range of tools
  - Word processing Database
  - Drawing, Painting Spreadsheet
  - Multimedia: audio, video Utilities
- *http://www.fi.edu/fellows/fellow3/jan99/coinproject/home.htm*
- Your Mission: Go to the Technology Tools page.
  - Identify those resources that might be available in your school.
- Directions
  - Give good instructions
    - step-by-step instructions
    - list of requirements
    - examples & nonexamples
    - models & samples
  - Stay flexible!
- *http://www.gis.net/~peacewp/webquest.htm*
- Timeline
  - Unlike a tree, you don't have centuries
  - How long will students be working on this project?
  - What's realistic?
  - Give students guidelines
- *http://wneo.org/gasp/*
- Your Mission
  - Identify an engaging activity and design an project.
- *http://powayusd.sdcoe.k12.ca.us/pusdphs/dmoore/index2.html*
- Spotlight on Songs
  - Assess Student Learning
  - Spotlight student success.
  - Share a story or sing a song around the campfire.
- Why Assess
  - What have your students learned?
  - Assessment isn't about testing and report cards.
  - It's about helping you and your students understand where you've been and where you still need to go to reach your learning outcomes.
- Process Assessment
  - It's the walk that matters
- Product Assessment
  - It's the view at the end that matters
- *http://edweb.sdsu.edu/triton/july/rubrics/Rubrics_for_Web_Lessons.html*
- *http://memorial.sdcs.k12.ca.us/LESSONS/WWII/WWIIunit/HyperStudiorubric.html*
- Your Mission: Go to Student Success
  - Identify ideas for assessing student performance.
  - Brainstorm alternative assessments to match your outcome and activity.
- Make Camping Fun!

Ideas for Happy Campers!

Keep up to date
  Find a home
  Follow "new links" or "best links"
    mailing list   weekly hot list
http://school.discovery.com/schrockguide/sos.html
http://www.homeworkcentral.com/top8/vsl_top8_list.asp
http://www.stemnet.nf.ca/CITE/emaillists.htm

Match to standards
  National State Local
http://clearinghouse.k12.ca.us/c/@BtxgI2Y.3H5to/bystandard.html

Do it regularly
  Current events
  This day in history
  Word of the day
  Math problem of the week
  Project of the month
http://www.wordcentral.com/cgi-bin/bwwod.pl
http://www.Cool-Fact.com/

Preselect Sites
  Don't camp in the dark!
  Plan ahead and preselect quality websites.
http://www.lausd.k12.ca.us/web_design/lighthouse_keeper/lighthouse_main.html

Remember Visuals
  You remember what you see.
  Use sites with lots of visual representations.
  Ask students to create
  their own visuals.
http://www.thevirtualwall.org/

Chunk Your Project
  You can't carry a tree, but you can carry chunks of wood.
  Chunk your project into reasonable pieces.
http://members.aol.com/donnandlee/SiteIndex.html

Make Good Stew
  Generate excitement!
  Fun, flexible environment
http://www.artyastro.com/

Authentic projects Real world audiences
http://www.universitylake.org/primarysources.html
http://www.horus.ics.org.eg/

Provide Resources
  A stool needs three legs
  Provide multiple resources
  Adapt to change
http://eduscapes.com/42explore/poetry.htm
http://www.gigglepoetry.com/

Reflect
  Take time to reflect
  Allow time for sharing and enjoying your activities
http://www2.lhric.org/pocantico/taverna/taverna.htm

Encourage Uniqueness
  Let students take their own path
  Give students flexibility in the assignment
http://www.emulateme.com/

Watch from distance
  Do demonstrate, guide, suggest, help
  Don't do it
http://www.secretsatsea.org/

Don't Lose Anyone!
  Keep them in sight
  Use checklists, team meetings, and processfolios to keep track of progress.
http://home.earthlink.net/~tsdobbs/go.htm

Watch Out!
  You never know when you might have a problem.
  Watch for inappropriate links
  Carefully save files
  Stay organized
http://www.field-guides.com/trails.htm

Remember Water
  Don't forget the water.
  Remember the purpose of the activity.
http://www.askasia.org/adult_free_zone/afz_frame.htm

Watch the Food
  Too many beans can spoil a trip.
  Take baby steps, Select tutorial sites
http://mgd.nacse.org/hyperSQL/lichen_teach/

Be Prepared
  Wear your boots, not your sneakers.

Plan student access:
  bookmarks, worksheets, activity web pages
http://unidata.ucar.edu/staff/blynds/rnbw.html

Think Timeline
  Finish before the snow falls
  Be realistic

Build in a cushion
  Be prepared   Print out the sites
http://www.audreywood.com/mac_site/activity_pages/activities_page.html

Provide support
  Lend a hand   Work with another teacher
  Help each other! Team with another grade

Prairies, Pioneers & Partnerships: *Matching Standards, Resources, and Engaging Projects*

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http://eduscapes.com

Overview
- Align Content/Standards
- Transform Traditional Activities
- Create WebQuests
- Develop Project Partnerships
- Manage Projects: Empowering Students

Content & Standards
- Pioneers were disappointed to find how few supplies would fit into their wagon.

Identifying Standards
- National Gov't
- National Groups
- State Level
- Local Level

http://www.negp.gov/
http://www.negp.gov/WEBPG10.htm
http://www.negp.gov/Reports/20nelson.htm
http://www.edweek.org/context/orgs/
http://www.aasa.org/index.htm
http://www.aasa.org/Issues/assessment.htm
http://www.neat-schoolhouse.org/Office/Teacher/Classroom_Related/Educational_Associations.html
http://www.nsta.org/
http://www.ncss.org/
http://www.ncss.org/standards/toc.html
http://www.edweek.org/context/topics/assess.htm

State Level
- Compare state standards
- Use other states for ideas
- Look for online ideas

http://putwest.boces.org/Standards.html
http://putwest.boces.org/StSt/Illinois.html
http://www.isbe.state.il.us/ils/default.html
http://www.isbe.state.il.us/ils/intro/history.html
http://www.springfield.k12.il.us/standards/fourth/index.htm
http://admin.doe.k12.ga.us/gadoe/sla/qcccopy.nsf/MainNav?OpenNavigator
http://www.uen.org/cgi-bin/websql/lessons/query_lp.hts?grade=4&area=3
http://www.ncrel.org/ncrel/sdrs/areas/gs0cont.htm
http://www.mcrel.org/standards/
http://www.mcrel.org/standards/articles/8-questions.asp
http://www.mcrel.org/standards-benchmarks/
http://www.mcrel.org/resources/plus/

Lesson Plans
- Take the easy route.
- Find help!
  - Lesson plans Project ideas Web resources

http://encarta.msn.com/schoolhouse
http://www.microsoft.com/education/lesson/default.asp
http://ericir.syr.edu/Virtual/Lessons/
http://scrtec.org/track/
http://l2l.ed.psu.edu/success/L2L_INDX.HTM
http://thegateway.org/
http://sunsite.berkeley.edu/InternetIndex/

Pioneer Life
- Don't let standards scare you!
- Create charts
- Match content
- Toss the rest!

Transforming Traditional Activities
- To survive on the prairie,
  - pioneers had to modify their old ways and learn new skills.

http://eduscapes.com/42explore/prairie.htm
http://mbgnet.mobot.org/sets/grasslnd/main.htm
http://mbgnet.mobot.org/sets/grasslnd/story/index.htm
http://www.highlands.w-cook.k12.il.us/prairie/prairie1.html
http://www.blackfootedferret.org/prairie.html#top
http://www.inhs.uiuc.edu/~kenr/tallgrass.html
http://www.tallgrass.org/
http://www.greatplains.org/npresource/1998/ppregion/ppregion.htm
http://eduscapes.com/42explore/pioneer.htm

http://www.museum.state.il.us/exhibits/athome/1800/welcome.htm
http://lcweb2.loc.gov/ammem/today/may20.html
http://tqjunior.advanced.org/6400/
http://www.bright.net/%7etomhoman/page31.html
http://www.bright.net/%7etomhoman/page43.html
http://www.carlinville.macoupin.k12.il.us/west/frontier.htm
http://www.osv.org/kids/articles5.htm
http://eaves.math.utk.edu/~williams/Pioneer/pioneer.html
http://eduscapes.com/42explore/farming.htm
http://eduscapes.com/42explore/oralhst.htm
http://eduscapes.com/42explore/journl.htm

- Literature Ladders
  - Book Connections
  - Authors Lesson Plans Content Resources

http://eduscapes.com/ladders/index.html
http://eduscapes.com/newbery/86a.html
http://www.harperchildrens.com/howabook/pmstate.htm
http://k12.albemarle.org/Sutherland/MPicard/studentPublishing/authorEssays/maclachlan.html
http://www.sdcoe.k12.ca.us/score/sarah/sarahtg.htm
http://collaboratory.nunet.net/bookclubs/sarah.html
http://www.amered.com/curr/mwspt.html
http://www.eduplace.com/kids/rdg/kidviews/grade4/sarah.html

- Explore Lesson Plans
  - Match to your outcomes
  - Transform a traditional activity
  - Action Word Ideas
  - Student Project Ideas
- Plan Trips
  - Around Illinois
  - Trace a historic journey
  - Trace Sarah's trip

http://mapquest.com

- Use Graphics
- Copy pictures
  - make postcards
  - write a story
  - write a letter
  - a day in the life

http://www.ukans.edu/carrie/kancoll/graphics/
http://www.ukans.edu/carrie/kancoll/graphics/elsmore.htm

- Modify Photos

http://members.aol.com/ntgen/hrtg/wol.html
http://www.usps.gov/history/his1.htm

- 5Ws Project
  - Where are you?
  - Who's with you?
  - What are you doing?
- Sarah's Prairie Life
  - Today and Yesterday
  - Compare Maine & Kansas
  - Prairie plant/animals

http://www.awav.net/prairie/
http://www.awav.net/prairie/prairie.html
http://www.wheatmania.com/

- Sarah's Maine
  - Seashore Ocean Shells Sealife

http://coa.acnatsci.org/conchnet/do.html
http://www.uwp.edu/academic/biology/bmsm/selshels.htm
http://www.wildlupine.com/andrewruelphotography.htm

- Use Photos
  - Postcards Poems
  - Reports News articles
- Wildflowers
  - List the wildflowers from the book
  - Ragwort
  - Create a prairie mural
  - Build an online wildflower trail

http://www.npwrc.usgs.gov/resource/literatr/wildflwr/wildflwr.htm
http://history.cc.ukans.edu/heritage/prairie/prairie.html

- Transforming Activities
- Scanner
  - Scan seeds leaves
  - bark outdoor objects
- Digital Camera
  - Photograph plants animals
  - people objects
- Paint Software
  - Draw maps
  - Create landscapes
  - Sketch plants
  - Combine scanning, photos, clip art
- Sounds
  - Animals Outside sounds
  - Folk music Instruments

- Real Objects
  - Describe Speculate
  - Compare Create
  - Create
- Combine
  - word process clip art
  - paper markers
  - boxes
- Expand
  - Don't just scoop, apply...
    - defend decide
    - create persuade
- Natural Area Projects
  - What's a prairie?
    - plants animals
    - water objects

http://www.sd81.k12.wa.us/Regal/DishmanHills/56DHill.htm
http://imc.lisd.k12.mi.us/wayne/alsummer.html
http://imc.lisd.k12.mi.us/wayne/august/flowers/august.html

- Prairie Exploration
  - Plants Animals
  - Murals Recreations

http://ngp.ngpc.state.ne.us/wildlife/critters.html

- Try It

http://ngp.ngpc.state.ne.us/sounds/sounds.html

  - Copy a picture and a sound.
  - Learn more about your animal!
- History Projects
  - Living history farms and museums
  - Artifacts recording creating

http://westville.org/
http://www.museum.state.il.us/mic_home/

- Pioneer Tools
  - Trace the history of a tool: then & now
  - Create a tool matching game
  - Identify the purpose of tools

http://www.connerprairie.org/cp/agimp.html
http://www.lis.ab.ca/walton/old/
http://www.lis.ab.ca/walton/old/butter.html

- Pioneer Food
  - Food Recipes
  - Healthy eating

http://www.iron.k12.ut.us/schools/north/cookbook/introduction.htm
http://www.carlinville.macoupin.k12.il.us/west/kitchen.htm
http://little.nhlink.net/nhlink/educatio/teaching/es/es03d.htm
http://www.jerkyusa.com/recipes.html
http://scholar.coe.uwf.edu/pacee/steps/two/west/day11.htm
http://tqjunior.advanced.org/6400/recipes.htm

- Pioneer Experience
  - Compare pioneers from different areas and time periods

http://heritage.uen.org/cgi-bin/websql/index.hts

- Pioneer Arts & Crafts
  - Write step by step instructions
  - Take digital pictures

http://users.drak.net/magick_manor/dip.html
http://www.campbellusd.k12.ca.us/~kwoods/woodscor.htm
http://www.ontariocorn.org/husk2.html
http://www.jb.man.ac.uk/~caj/wheel.html
http://www.lis.ab.ca/walton/old/soaphome.html
http://www.millennium-ark.net/News_Files/INFO_Files/Soapmaking.html
http://www.millennium-ark.net/News_Files/INFO_Files/Lye_Safety_Precautions.html
http://seasonalchef.com/appledehyd.htm
http://www.marketreport.com/preserves21.htm
http://www.cityblues.com/dryfood.htm
http://eagle.cc.ukans.edu/~mdpear/jayhawk.html
http://highlightpro.com/text.htm
http://www.kinderart.com/littles/pquilt.htm

- Explore Books
  - Prairie Pioneer
  - Nature History
- Sarah, Plain and Tall
  - Patricia MacLachlan
  - Kansas Prairie
- Quilt-Block History of Pioneer Days
  - Mary Cobb
  - Pioneer Crafts
- Prairie Born
  - Dave Bouchard
  - Canadian Prairie
- Pioneer Workshop
  - Judy Cole Mary Minturn
  - Pioneer Crafts
- Prairie Songs
  - Pam Conrad
  - Nebraska Prairie

Black-Eyed Susan
    Jennifer Armstrong
    Dakota Prairie
The Ballad of Lucy Whipple
    Karen Cushman
    Gold Rush
Buffalo Thunder
    Patricia Wittmann
    Oregon Trail
Fun with Nature
    Plants Animals
    Nature
Gardening Wizardry for Kids
    L.Patricia Kite
    Gardening Nature
365 Nature Crafts & Activities
First Field Guide Wildflower
    National Audubon Society
Canoe Days
    Gary Paulsen
    Nature
Animals
    Tops & Bottoms
    Janet Stevens
    Plants Gardening
Weslandia
    Paul Fleischman
    Civilization Creativity
    Fantasy
http://eduscapes.com/ladders/ladders.html
Build a lesson
    Brainstorm pioneer & prairie topics
    Identify outcomes
    Locate 1-5 sites
    Create an activity
    Transform Activities
Creating WebQuests
    Some pioneers fought the prairie, while others lived with the prairie.
http://www.stbernard.org/WebQuest%20Activities/pioneer.html
http://inst.augie.edu/~jamounta/west/quest.htm
Introduction
    Dig In
    Motivation
    Sets the stage
    Provides background information

http://projects.edtech.sandi.net/chavez/batquest/batquest.html
Brainstorm Intros
    Picture Quote
    Poem Situation
    Song
Task
Something doable & interesting
    series of questions
    summary to be created
    problem to be solved
    position to be debated
    creative work
    require thinking!
Information Resources
Specific, appropriate resources
    web documents
    experts available via Internet
    searchable databases on the net
    books and other documents
    real objects
Process
    List of activities
    Step-by-step instructions
    Timeline
Learning Advice
Describe how to organize info
    Guiding questions
    Directions to complete
    checklists, timelines
    concept maps
    cause-effect diagrams
    action plan
Evaluation
    Assess student work
        checklists
        rubrics
Conclusion
    Bring project to closure.
    Remind learners about what they've learned
    Encourage learners to extend the experience
Other Elements
    Roles to play
    Group collaboration guidelines
    Motivating scenario
    Teacher Resources
http://projects.edtech.sandi.net/chavez/batquest/teacher.html

Explore & Evaluate
Explore a webquest
Evaluate a webquest
Create a webquest
http://edweb.sdsu.edu/webquest/webquest.html
http://edweb.sdsu.edu/webquest/matrix.html
http://edweb.sdsu.edu/people/bdodge/webquest/buildingblocks.html
http://edweb.sdsu.edu/webquest/webquestrubric.html
Brainstorm Topics
Prairies & Pioneers
quilts crafts
plants animals
Create a webquest
Developing Project Partnerships
Although they often lived miles apart, pioneers relied on one another.
http://askanexpert.com/
http://www.vrd.org/locator/subject.html
http://www.gsn.org/project/index.html
http://www.eduplace.com/projects/how2.html
http://www.siec.k12.in.us/~west/online/join.htm
http://www.kidlink.org/KIDPROJ/
http://www.pitsco.com/p/Respages/collab.html
http://home.talkcity.com/academydr/nicknacks/NNindex.html
http://cleo.terc.edu/cleo/cleo-home.cfm
http://www.eduplace.com/hmco/school/projects/online.html
http://www.hmco.com/hmco/school/projects/index.html
Connect with Class
Another
county state country
http://www.epals.com
http://www.ks-connection.com/penpal/penpal.html
http://www.keypals.com/
Manage Projects
Empower your students so they can survive on the cyber-prairie!
Build an environment
Provide...
A variety of tools
A place to start
An engaging, classroom environment
Provide support
Step-by-step help sheets
Each one, teach one
Ask three before me
Create a headquarters
Bulletin board
Folders
Website
Make it happen
Focus on individual needs
Keep it simple
Find friends to help
Make it real-world!
Make it engaging!
Have Fun!
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Books by Annette Lamb

Newberys and the Net:
Thematic Technology Connections
Annette Lamb & Larry Johnson
ISBN 1-891917-02-1 c2000 $28.95
Virtual Sandcastles:
Teaching and Learning at a Distance
Annette Lamb & William Smith
ISBN 1-891917-01-3 c1999 $23.95
Cruisin' the Information Highway:
Internet in the K-12 Classroom (2nd Edition)
Annette Lamb & Larry Johnson
ISBN 0-9641581-6-7 c1995, 1997 $23.95
Surfin' the Internet:
Practical Ideas from A to Z (2nd Edition)
Annette Lamb, Nancy Smith & Larry Johnson
ISBN 0-9641581-9-5 c1996, 1997, 1998 $26.95
Spinnin' the Web:
Designing & Developing Web Projects
Annette Lamb
ISBN 0-9641581-9-1 c1998 $26.95
Building Treehouses for Learning:
Technology in Today's Classrooms (2nd Edition)
Annette Lamb
ISBN 1-891917-00-5 c1996, 1999 $34.95
The Magic Carpet Ride: Integrating Technology into the K-12 Classroom (2nd Edition)
Annette Lamb
ISBN 0-9641581-8-3 c1997, 1998 $23.95

Contact Nancy Smith for order and shipping information

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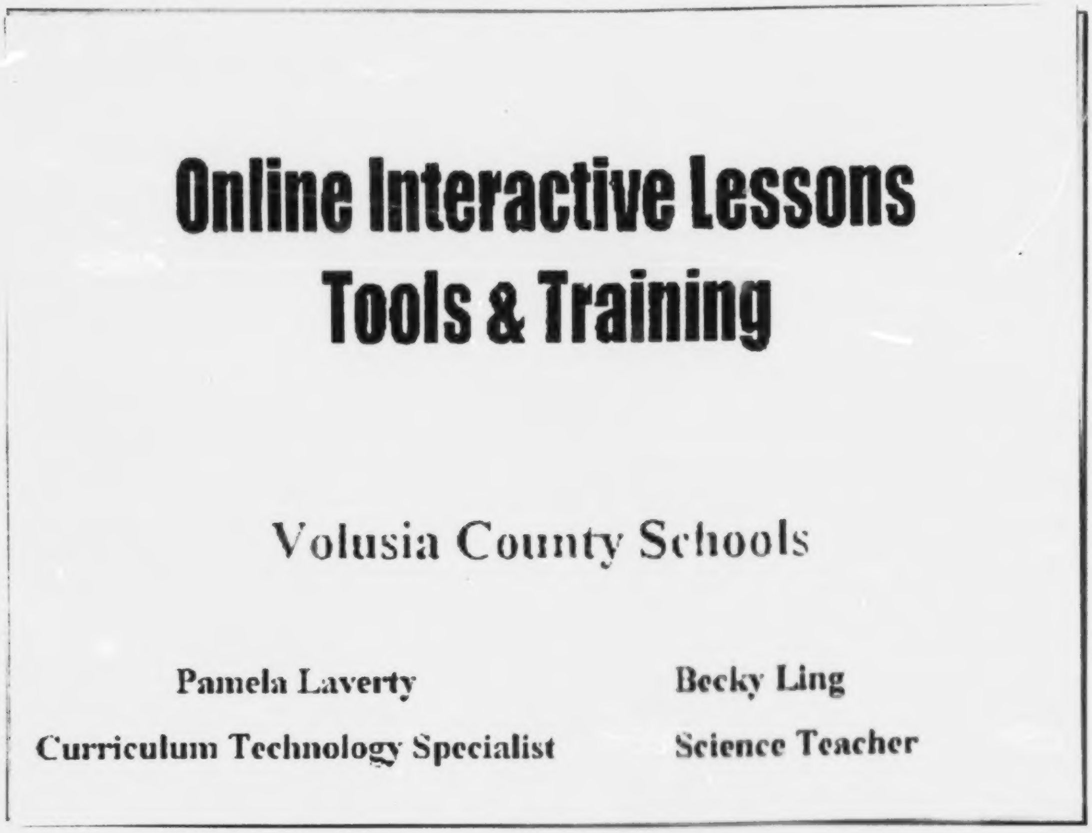


Online Interactive Lessons
Tools & Training

Volusia County Schools

Pamela Laverty
Curriculum Technology Specialist

Becky Ling
Science Teacher

BEST COPY AVAILABLE

NatureShift! Linking Learning to Life

Title: Light Me Up

Concept or Theme: Electricity - constructing an electrical circuit.

Discover Question: How can you light up a light bulb?

Background: None needed

Supplies/Materials:

- Flashlight bulb (1.5 Volt)
- Battery (C size works well)
- Nail (approximately 3 inches)
- Penny
- String, ribbon, cardboard, piece of plastic
- Special foil (approximately 6 in. x 6 in.). To make special foil stick clear contact paper onto the shiny side of aluminum foil. This is easiest if both rolls are 16 inches wide.

Place all supplies, except batteries, in a plastic (ziploc) bag. Provide masking tape on each table (this is very useful!).

Procedures:

This activity takes approximately 45 minutes with 1st to 3rd graders. Depending on learners' prior experience this time may need to be extended or shortened.

1. You can introduce the activity any way that is appropriate for your class. I have told learners that they need to help NASA repair the Mars Rover which has some broken wires. Thus NASA has asked them to figure out how circuits work.
2. Hand out the ziploc bags with the materials and a battery to each learner. I usually do not tell learners names for the objects but refer to them as "shiny stuff", colored stuff, etc.
3. Record learners' observations on the board. "The shiny stuff gets hot when I wrap it around the battery!" "There are 2 shiny ends to the batteries." "There are two shiny ends on the light bulbs."
4. Ask questions that are open-ended "What have you tried?" "What else could you try?" "What do you notice about your objects?"
5. Once some one has success encourage further exploration.
    - Can you light the bulb any other way?
    - What is the smallest amount of shiny stuff you can use to light the bulb?
    - What other objects work and don't work to light the bulb?
6. Introduce the idea of a circuit.
7. Make a list of what can and can not light the bulb. Explore other objects as well like pencils, pens, scissors, chair or desk legs etc.
8. Talk about list of objects that can light the bulb. What do they have in common - shiny, hard, conduct electricity, conduct heat… Scientists refer to these objects as metal.

Steve Lindaas lindaas@dakota-science.org

9. Discuss results from other extensions you may have explored.

Internet Resource:

None required. This is part of a NatureShift unit on electricity and magnetism that can culminate in controlling the Mars Rover telerobot.

Assessment Ideas:

Can the learner turn on the light bulb?
How many different materials can a learner use to turn on the light bulb?

Extensions:

- "Now that you have it light, make it bright?" Provide extra batteries of various sizes (AA, C, D). Does the size of the battery make a difference?
- Make a flashlight.
- Cut up a string of Christmas tree lights and hand out. Light one or a whole bunch with a friend.
- Make a game like "operation".
- Make a game where a loop has to trace a curvy wire. If they touch a light turns on.
- Make a robot with eyes and a nose that lights.
- Make a buzzer or motor work.
- Light a L.E.D (light emitting diode)
- Discuss serial and parallel connections

Age/grade level/accessibility adaptations:

This activity has been used successfully with 1st to 3rd graders as well as college undergraduates.

Safety Considerations:

- Drop anything that gets hot. This will happen if a battery is "short circuited" by connecting the top and bottom with a conductor like the aluminum foil.
- If this is a multi-day activity collect batteries.

NatureShift! Linking Learning to Life

Explainer Hints

- ***Inquiry***
- ***Critical Thinking***

Hands-on Learning
Hands-off Teaching

Questions/approaches to use:

- What have you tried?
- What worked well?
- What could you do next?
- What else can you try?
- How many ways can you do this …
- Can you use different materials?

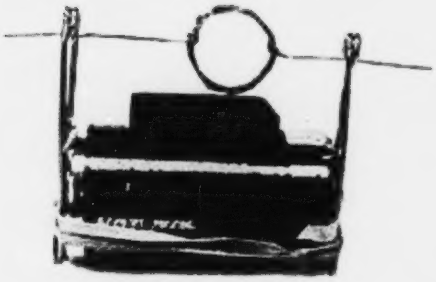
Don't steal the joy of discovery!

1. **Do** - let students find on/off buttons!
2. **Do** - let students do weird stuff!
3. **Do** - Encourage sharing!
4. **Do** - Encourage exploration
   (breaking stuff can be okay)

Steve Lindaas lindaas@dakota-science.org

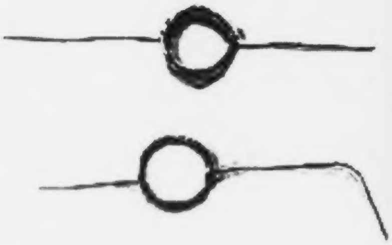
http://www.natureshift.org

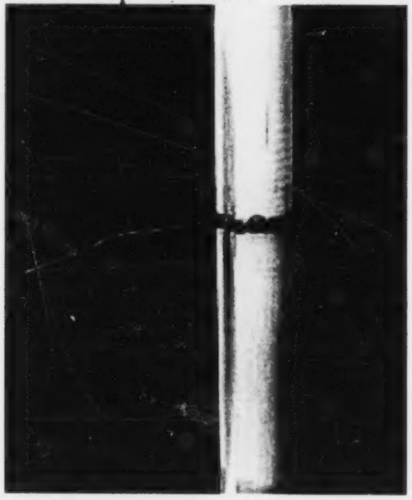
Simple Motor Directions



You will be building a simple motor using the materials you have been provided. This will require you to make a circuit (which you did when you made the light bulb light up), use the permanent magnet and make an electromagnet.

1. Use the enamel wire. Leaving a 3 cm tail on either side, wind the wire into a coil with a diameter slightly larger than 1 cm. Wrap each tail a couple times around the coil to hold it together. The wooden spool allows you to coil and make the finish wrap in its slots.





2. Remove the enamel from the top of both tails. If you place the spool with the wire coil on it in the groove of the wooden base you can scrape the enamel off of both sides using the sandpaper board.

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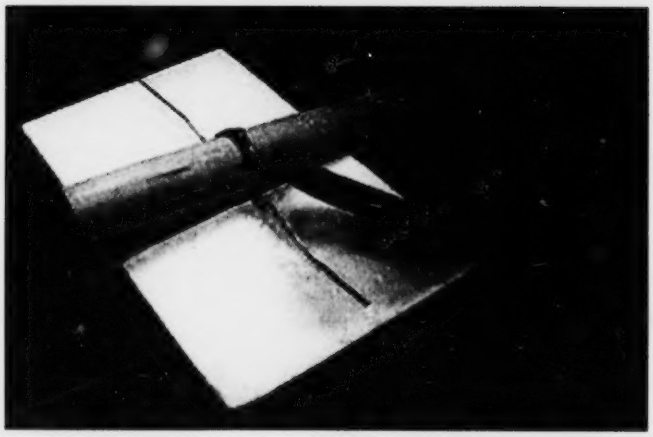
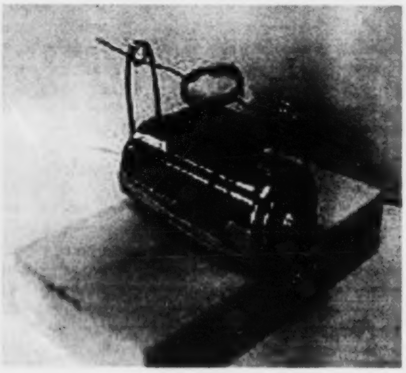


3. Secure the safety pins to the battery ends with tape or a rubber band. Place the magnet on top of the battery and position the wire coil through the hinged ends of the safety pins that should be sticking above the magnets.



4. Troubleshooting:
   - If your wire just rocks adjust the balance. Balance is crucial so try bending/straightening the coil and tails. You can also add a small piece of tape to the coil to adjust the balance.
   - If your wire coil does not spin, make sure that enough enamel is removed from the tops of both tails. You may have to scrape the wire with the sandpaper some more.
   - If your wire coil does not spin, make sure that the enamel is removed from just one side of each tail and that it is the same side. NOTE: If you took off too much enamel, you can use a permanent marker to replace the missing enamel. Just draw a mark where you want to replace enamel.

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Robot Directions

The following are some hints to help you carry out your role as a multi-purpose robot today.

WHAT:

The Learners will be writing down instructions for a "multi-purpose" robot to make frosting and graham cracker snacks. [You are the "multi-purpose" robot!]

PURPOSE:

Demonstrate that a computer program

1. is a set of instructions.
2. must be exact to avoid problems
3. is not always fool-proof

TASK:

You **MUST** follow the directions literally! For instance, if the direction is to "Take the frosting out" you could get up and walk out (side) and continue down the sidewalk. The programmers will have to run up with a "stop and return" command written on a paper to get you to come back. Or perhaps if the direction is to "Take the frosting out and spread on the cracker" then you should take the frosting package and place it on the cracker package or place it on a cracker and smash it. Any of the following can cause a robotic meltdown or unexpected robotic behavior.

- They must specify which frosting to use.
- They must specify a utensil to use. (You can use the wrong end of the knife if you are being mischievous.)
- They must be specific in opening and closing packages. If a package is closed and you have no directions to open it you might spread frosting on the package. If a package is open and you have directions to open it you might have a robotic meltdown.
- They must be specific in locating objects. There will basically be two places for objects - inside the "box" or on the table. If they do not specify the location your default is to look in the "box". If you do not find the object you can have a robotic meltdown.
- They should specify what is to be done with the snack (hopefully "feed to a human"). A mischievous robot might eat the snack and then have a robotic meltdown. If nothing is specified a robot may walk over to the trash and throw a frosting sandwich away.
- If you are having trouble reading the directions you can ask one of the RoboTechs to read what they have written. I don't want to worry too much about neatness.

Try to think of any way to follow the letter but not the intent of the program. Obviously, if the frustration index gets to high you can choose to be a tad less picky. Overall have fun!

Robotic Meltdown

A robot that is having a meltdown may make weird sounds, zaps or make weird twitching motions. After the meltdown the robot can not move (at least not much) until it is restarted and given new instructions.

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NatureShift! Linking Learning to Life

O'Neill, James

Energized, Paperless Research Projects
Original Author Submissions

Ostrager, Jennifer

Cablevision and Bethpage, NY: Partnering to Build a Lifelong Community of Learners
Cablevision and Bethpage Unified Free School District: Timeline of a Partnership
1999 CTPAA Beacon Award Winner
Cablevision Collaborates with Educators for powertolearn.com
Cablevision Teaches Seniors How to Surf the Net
Kramer Lane Teacher Creating Internet Curriculum
School's Out
Original Author Submissions

Palacio, Joycelin

Beyond Multiple Choice and Scores: The IMMEX Problem-Solving Assessment Approach (pdf format)

Petersen, Ruth

Glenn Learning Technologies Project
NASA Glenn Distance Learning Program
Original Author Submissions

Pook, Charlanne

The Kids are Running the School, School Network that is!
Original Author Submissions

Porter, Karin

Empowering Teachers Through CFBISD's Technology Integration Academy

Price, Catherine

What is the Learning Cycle ?
Planning a Learning Cycle
Technology Self-Report
Original Author Submissions

Reid, Susan

Online Learning with Amazon River Dolphins (pdf format)

Resta, Paul

Creating a Virtual Tour of the American Indian
A Virtual Tour of the National Museum of the American Indian Exhibitions: Creation's Journey and All Roads Are Good
Original Author Submissions

Ritter, Catherine

Selena On The Move: Bridging Internet Learning
Original Author Submissions

Roberts, Serena

Multiple Intelligences Survey
Enhancing Cross-Curricular Projects with Technology - Agenda
Original Author Submissions

Simeone, Mary

Original Author Submissions

Sindhikara, Jean

"Workshops that Work": List of Electronic Handouts
Internet Searches for Science Teachers
Using a Digital Camera to Enhance Learning
Computer Graphics for Teachers
"Workshops that Work": Computer Skills Template
Original Author Submissions

Siwinski, Carol

Jump Start Integration with the Internet
General Information for Web Graphics and Publishing a Site
Fireworks: Attaching Text to a Path
Fireworks: Making an Animation
Fireworks: Masking an Object
Fireworks: Saving a Fireworks Document
Fireworks: Working with Text
Fireworks: Working with Bars and Buttons
Original Author Submissions

Sprague, Debra

Project DEVISE: Creating Virtual Reality Environments for Learning Disabled Students (pdf format)

Stabler, Hank

Policy-Driven Technology Reform and Implementation
Original Author Submissions

Steinhaus, Kurt

Communicating a Strategic Vision of Education Technology to Key Decision Makers
Original Author Submissions

Stephens, Tammy

Using Computer Manipulatives in Elementary Math Instruction
Original Author Submissions

Sun, Jeff

Evaluating Technology's Impact on Teaching and Learning
Technology Evaluation, Organizing Questions
Developing Indicator Statements
Mapping Your District Technology Plan
technology Funding
Original Author Submissions

Taylor, Lydotta

Professional Development: A Comprehensive Approach ...
Original Author Submissions

Thurston, Catherine

CTER OnLine: Developing a community of practitioners via advanced technologies
Original Author Submissions

Tichenor, Caylen

Moving Beyond Hidden Roadblocks to Successful Technology Programs
Original Author Submissions

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Energized, Paperless Research Projects

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csmith@dist214.k12.il.us

Each of the following will link to the appropriate site for information on the paperless research project.

Planning and Resources

1. Rationale for Research Project, a list of reasons teachers give research assignments and how these paperless research projects meet most of them.

2. List of Disaster Topics, over 50 researchable disasters (some of them are Chicago-area based),

3. List of Contemporary Problems Topics, taken from back issues of *CQ Researcher*, these 100+ topics are divided into categories for easy student selection.

4. Calendar for Project, a calendar from a past use of this project illustrating how students spend their time researching and learning the software.

5. Bibliographic Forms, MLA format bibliographic entries for the most popular sources students use in their Works Cited pages.

6. Guide to Referencing Research, a guide that shows students how to incorporate internal referencing into their written work for various types of sources.

Idea Processing

7. Idea Cache, a method to assess student's knowledge of the topic and generate ideas that will guide the research.

8. The Double Entry Journal, a guide for the student on how to take notes and to make assessments and generate questions about the information gathered as he takes notes.

Presentation Project

9. Presentation Project Assignment, a list of requirements for the project based on the rubric the teacher will use to assess the student's work.

10. Rubric for Presentation Project, a ten-point descriptive rubric that covers everything from use of graphics and speaking ability to accuracy of information and audience participation.

11. Instructions for PowerPoint, a step-by-step, easy-to-use guide for creating a PowerPoint Presentation.

Web Page Project

12. Web Page Project Assignment, a list of requirements for the project based on the rubric used to assess the student's work.

13. Rubric for Web Page Project, a ten-point descriptive rubric that covers everything from use of graphics and workable links to accuracy of information and referencing technique.

14. Claris Home Page Instructions, a step-by-step, easy-to-use guide to building a web pages using this popular software.

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THE POWER TO LEARN℠

Cablevision and Bethpage, NY:
Partnering to Build a Lifelong Community of Learners

Presenters: Terrence Clark, Bethpage Schools
Tamara Black, Cablevision Systems
Jennifer Ostrager, Cablevision Systems

Cablevision Systems and the Bethpage Union Free School District formed an educational partnership in 1998 to study the impact of technology on a community. Focusing on technology as an agent for positive change, Cablevision and Bethpage Schools identified four major technology issues facing school districts. **Using Bethpage as a model, the partnership tried to find solutions that could be replicated in other school districts**. The four areas of concern and the proposed solutions include:

1. **Staff Development**
    . Teacher Institutes
    b. Collegial Circles
    c. Teacher Conference Days
    d. E-Mail Training
2. **Emerging Technologies/Total Cost of Ownership (TCO)/Obsolescence**
    . Thin-Client Lab
    b. Web Server housed at Cablevision
    c. E-Mail Server housed at Cablevision
3. **Gender Equity**
    . Planning K-12 Forum planned for next year
    b. Work with District Personnel, PTA, Cablevision, Possibly Local College
4. **Home-School and Community Connections**
    . Bethpage Community Web Site, connecting schools, businesses, civic/religious, and recreational facilities.
    b. Senior Citizen Training (two years)
    c. High School Computer Lab open to Community Members
    d. Assist as mentors for 8th Grade Curriculum- Web Folios
    e. Internet Safety Seminar for Parents

BETHPAGE UFSD

CABLEVISION

Cablevision and Bethpage, NY: Partnering to Build a Lifelong Community of Learners

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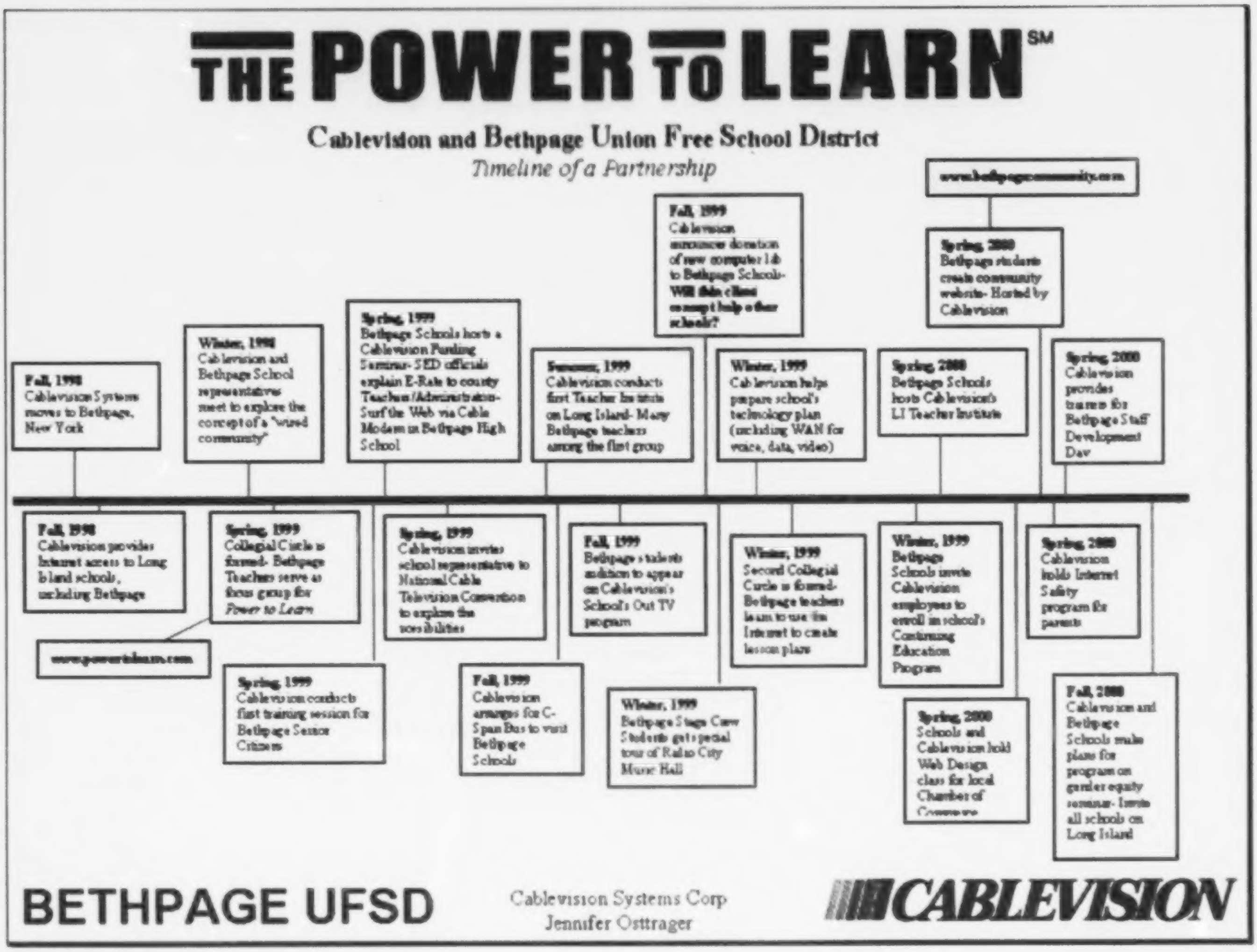

THE POWER TO LEARN℠

Cablevision and Bethpage Union Free School District

Timeline of a Partnership

Fall, 1998
Cablevision Systems moves to Bethpage, New York

Fall, 1998
Cablevision provides Internet access to Long Island schools, including Bethpage

Winter, 1998
Cablevision and Bethpage School representatives meet to explore the concept of a "wired community"

Spring, 1999
Collegial Circle is formed- Bethpage Teachers serve as focus group for *Power to Learn*

www.powertolearn.com

Spring, 1999
Bethpage Schools hosts a Cablevision Funding Seminar- SED officials explain E-Rate to county Teachers/Administrators- Surf the Web via Cable Modem in Bethpage High School

Spring, 1999
Cablevision conducts first training session for Bethpage Senior Citizens

Spring, 1999
Cablevision invites school representative to National Cable Television Convention to explore the possibilities

Summer, 1999
Cablevision conducts first Teacher Institute on Long Island- Many Bethpage teachers among the first group

Fall, 1999
Cablevision arranges for C-Span Bus to visit Bethpage Schools

Fall, 1999
Bethpage students audition to appear on Cablevision's School's Out TV program

Fall, 1999
Cablevision announces donation of new computer lab to Bethpage Schools- **Will this client concept help other schools?**

Winter, 1999
Bethpage Stage Crew Students get special tour of Radio City Music Hall

Winter, 1999
Cablevision helps prepare school's technology plan (including WAN for voice, data, video)

Winter, 1999
Second Collegial Circle is formed- Bethpage teachers learn to use the Internet to create lesson plans

Winter, 1999
Bethpage Schools invite Cablevision employees to enroll in school's Continuing Education Program

Spring, 2000
Bethpage Schools hosts Cablevision's LI Teacher Institute

www.bethpagecommunity.com

Spring, 2000
Bethpage students create community website- Hosted by Cablevision

Spring, 2000
Schools and Cablevision hold Web Design class for local Chamber of Commerce

Spring, 2000
Cablevision provides trainers for Bethpage Staff Development Day

Spring, 2000
Cablevision holds Internet Safety program for parents

Fall, 2000
Cablevision and Bethpage Schools make plans for program on gender equity seminar- Invite all schools on Long Island

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Cablevision Systems Corp
Jennifer Osttrager

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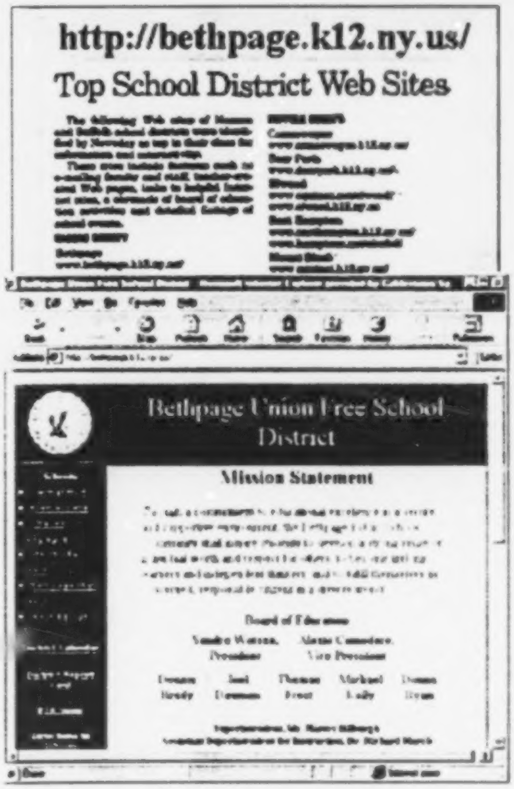

http://bethpage.k12.ny.us/

Top School District Web Sites

Bethpage Union Free School District

Mission Statement

Board of Education

CABLEVISION THE POWER TO LEARN

Spotlight on:

Local Weather & News

Environmental Expert

Ask The Expert

http://www.powertolearn.com

1999 CTPAA

Beacon Award Winner

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Cablevision Systems Corp.
Jennifer Ostrager

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THE POWER TO LEARN℠

Cable in the Classroom Magazine, March 2000

CABLEVISION NEWS

http://www.cablevision.com • http://www.powertolearn.com

Cablevision Collaborates with Educators for Powertolearn.com

Cablevision enhanced its commitment to providing high-speed Internet connections to every public and private school and community library in its service areas with the launch of the Power to Learn Web site, an interactive educational site. From the beginning, educators played a vital role in developing both the site's educational content and its virtual community, an area that supports technology-enriched learning experiences.

To facilitate participation in this virtual community, Cablevision worked hands-on with a group of educators from the Bethpage school district in Long Island, N.Y., to develop authentic educational activities and resources. For five weeks, from December 1999 to January 2000, the educators met weekly for two-hour Curriculum Collaboration sessions. The group spent part of its time searching the Internet for resources that its members would use in their classrooms and recommend to other educators. Educators rated the sites and posted their reviews on Power to Learn. In addition, the teachers integrated the Web-based resources that they found into their curriculum as they designed lessons for use in their own classrooms. They posted their lessons online, where they are free to all educators who visit the site.

Bethpage educators help Cablevision develop content for the Power to Learn Web site.

Gina Rufrano, a fourth-grade teacher in Bethpage who participated in the group, located and evaluated the Tenement Museum Web site (http://wnet.org/archive/tenement) during her work in Curriculum Collaboration. "My students were able to take a field trip to the Tenement Museum without leaving the classroom," she explained. "The kids can read about the history of immigration and walk through several restored tenements using their mouse."

The Curriculum Collaboration group at Bethpage is one of the many ways that Cablevision is supporting the education community as they move toward integrating technology into the classroom. One goal of the sessions was to provide educators with the necessary tools to design lessons incorporating the Internet. But it was just as important for participants to gain a greater understanding of the potential that technology offers education.

To take advantage of the online resources offered by Cablevision, go to the Power to Learn Web site (http://www.powertolearn.com).

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THE POWER TO LEARN℠

Cablevision Teachs Seniors How To Surf The Net

Bethpage High School recently had a new type of student surfing the Web - senior citizens. The Cablevision Education Department conducted an Internet training seminar for senior citizens in the Bethpage community. The three-part seminar was designed to familiarize local area residents with how to use the Internet.

Participants were introduced to the layout of a Web page, basic Internet vocabulary and learned how to use the Web as an effective research tool. Upon completion of the seminar, seniors left with the knowledge and confidence needed to navigate the Web and utilize free e-mail accounts.

"Many of today's older citizens have a keen desire to learn about computers and the available technology," said Joan Hendricks, Senior Director of Community Affairs, Cablevision. "Cablevision was happy to reach out to the community and provide this fantastic opportunity."

Pictured is Donna DeSoto, Education Manager, instructing the group of seniors.

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THE POWER TO LEARN℠

Bethpage Tribune, March 31-April 6, 2000

Kramer Lane Teacher Creating Internet Curriculum

Bethpage Educator Creating Internet Curriculum - Vincent Perez a teacher at the Kramer Lane School, is working with Cablevision to use a commercial free web site, powertolearn.com, that allows teachers to leverage the power of the Internet by coordinating cyberspace lessons with classroom activities. Recently students using powertolearn.com found themselves "speaking" to Nobel laureate Dr. James Watson, co-discover of DNA, as part of the web site's effort to help teachers expand the horizons of their students Joining Mr. Perez is Dominic Antonacci (left) Cablevision Education Manager for Long Island.

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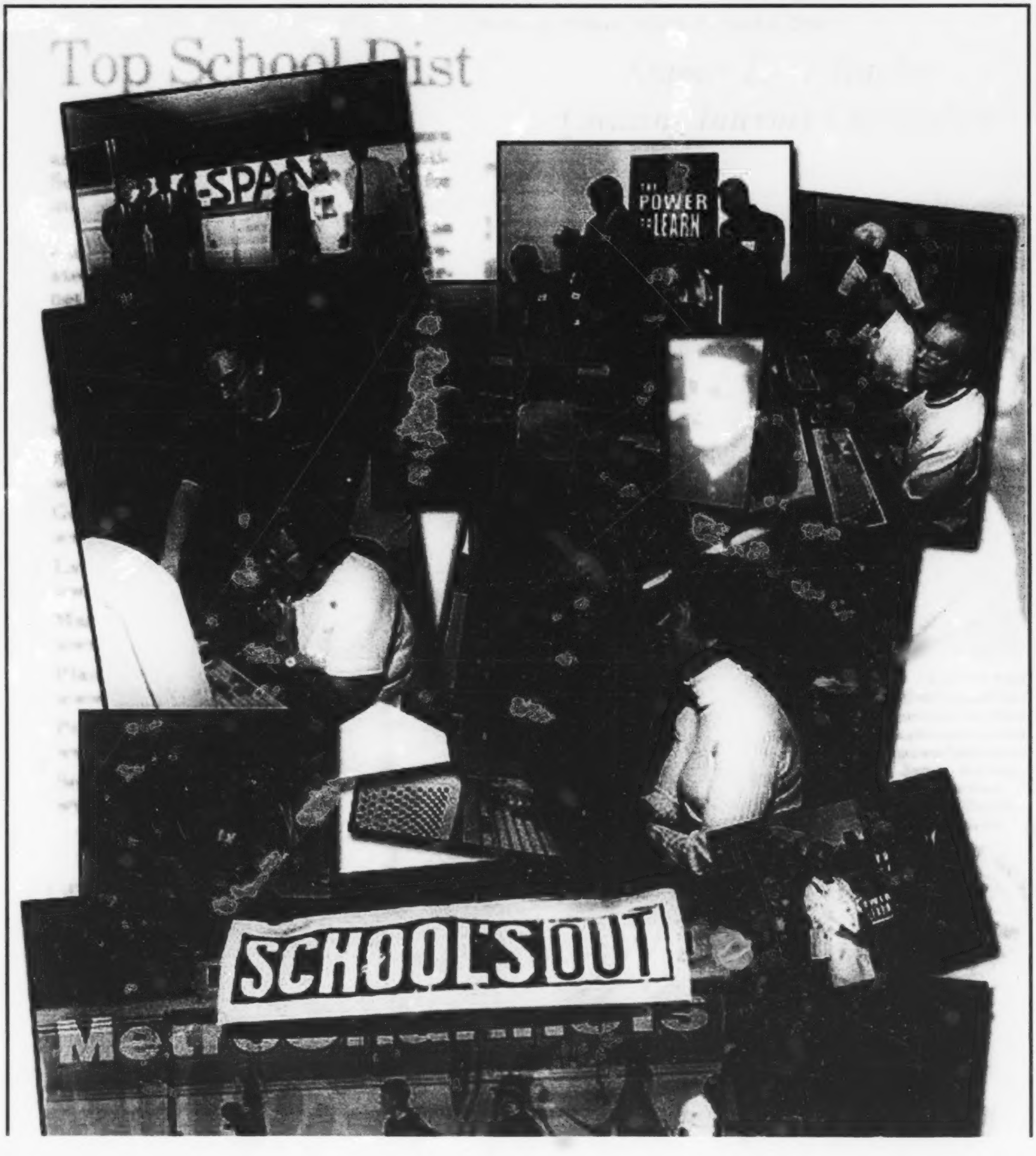
Top School Dist
C-SPAN
THE POWER TO LEARN
SCHOOL'S OUT

NEW YORK
NEW JERSEY

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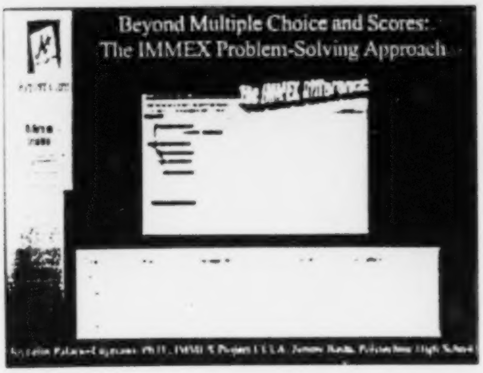
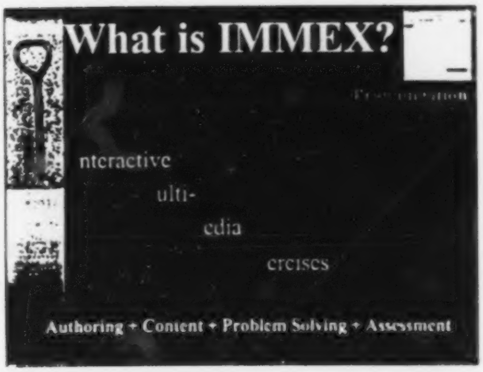


Beyond Multiple Choice and Scores:
The IMMEX Problem-Solving Approach

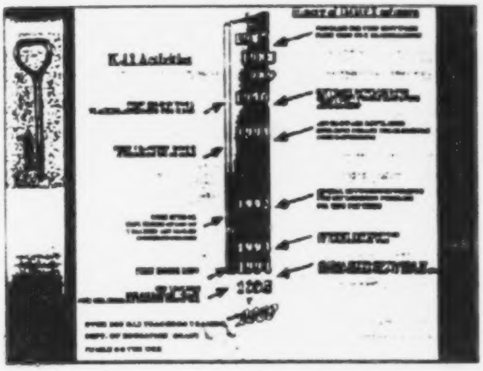
The IMMEX Difference



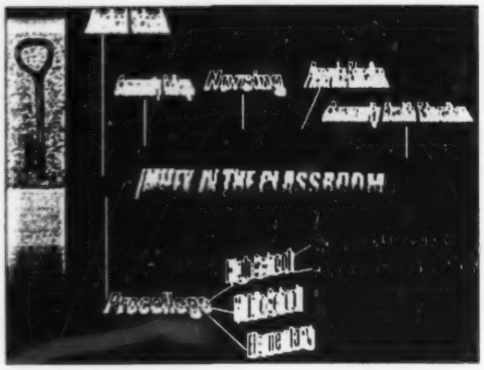
What is IMMEX?

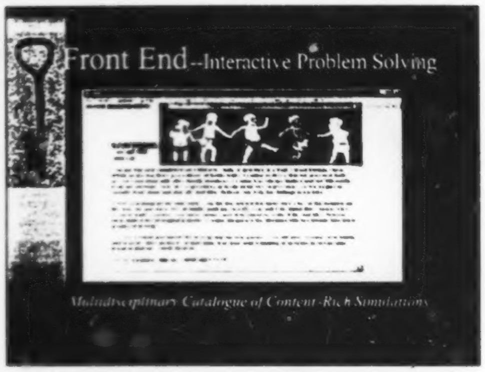
nteractive
ulti-
edia
ercises

Authoring + Content + Problem Solving + Assessment



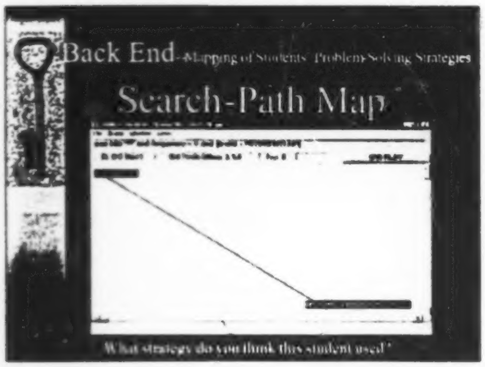
K-12 Activities


Medical School
Community College
Nursing
Parent Education
Community Health Education
IMMEX IN THE CLASSROOM
Precollege
High School
Middle School
Elementary



Front End--Interactive Problem Solving

Multidisciplinary Catalogue of Content-Rich Simulations



Back End-Mapping of Students' Problem-Solving Strategies

Search-Path Map

What strategy do you think this student used?

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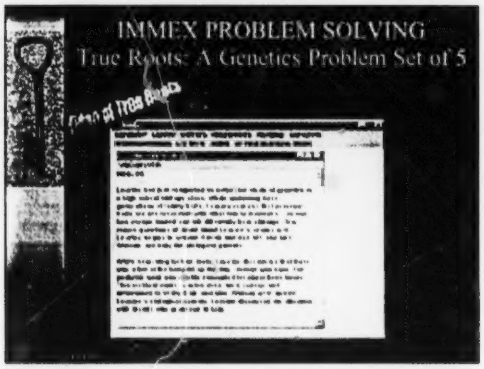
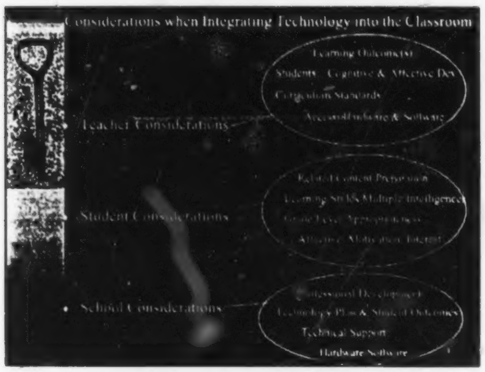
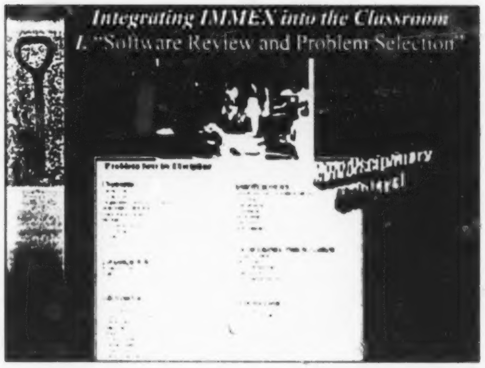


IMMEX PROBLEM SOLVING
True Roots: A Genetics Problem Set of 5



Considerations when Integrating Technology into the Classroom

- Teacher Considerations
  - Learning Outcome(s)
  - Students – Cognitive & Affective Dev
  - Curriculum Standards
  - Access to Hardware & Software
- Student Considerations
  - Related Content Preparation
  - Learning Styles/Multiple Intelligences
  - Grade Level Appropriateness
  - Affective: Motivation/Interest
- School Considerations
  - Professional Development
  - Technology Plan & Student Outcomes
  - Technical Support
  - Hardware/Software



Integrating IMMEX into the Classroom
I. "Software Review and Problem Selection"

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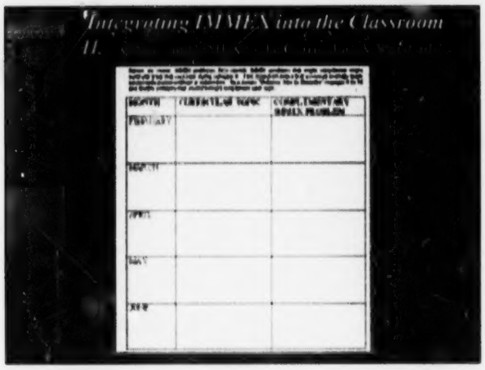
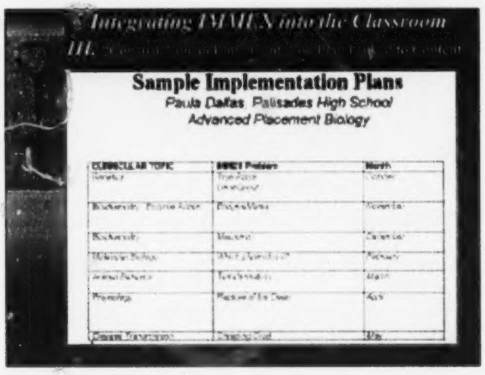


Integrating IMMEX into the Classroom

II. [illegible]

MONTH	CURRICULAR TOPIC	COMPLEMENTARY IMMEX PROBLEM
FEBRUARY		
MARCH		
APRIL		
MAY		
JUNE		



Integrating IMMEX into the Classroom

III. [illegible]

Sample Implementation Plans

Paula Dallas, Palisades High School
Advanced Placement Biology

CURRICULAR TOPIC	IMMEX Problem	Month
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
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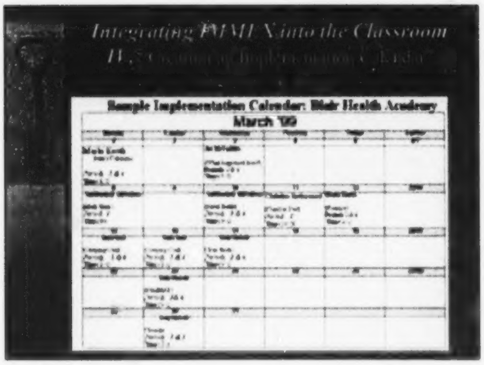

Integrating IMMEX into the Classroom

IV. [illegible]

Sample Implementation Calendar: Blair Health Academy

March '99

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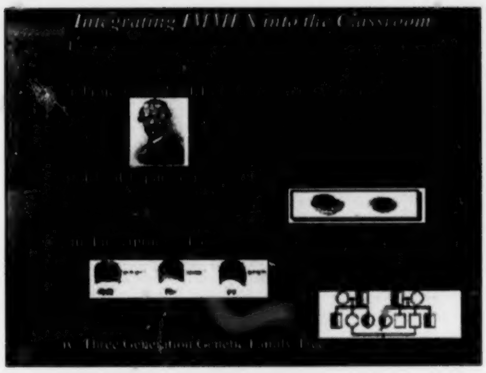
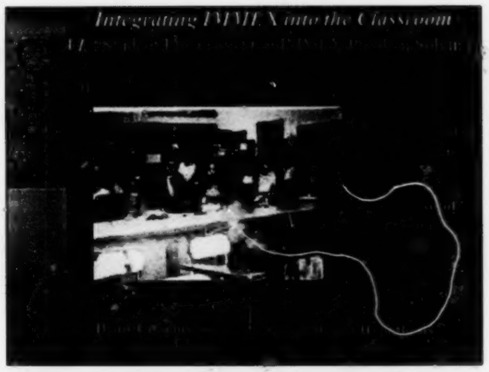
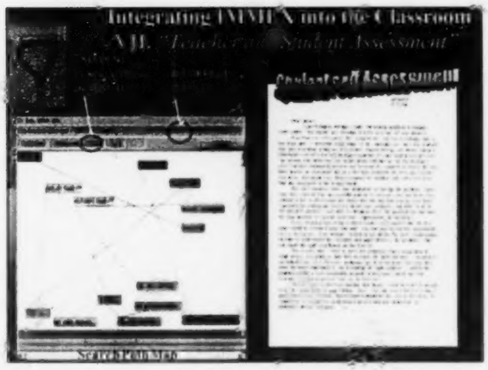


Integrating IMMEX into the Classroom

Three Generation Genetic Family Tree



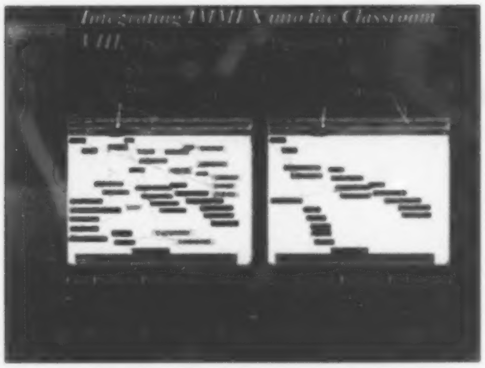
Integrating IMMEX into the Classroom



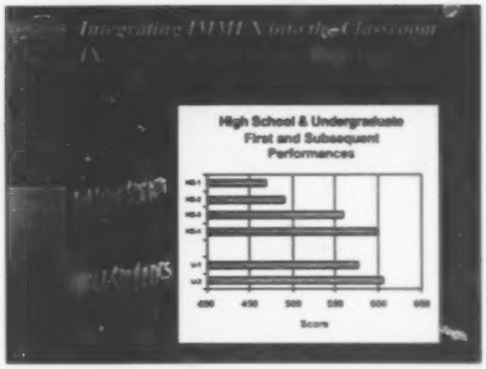
Integrating IMMEX into the Classroom

VIII. *"Teacher and Student Assessment"*

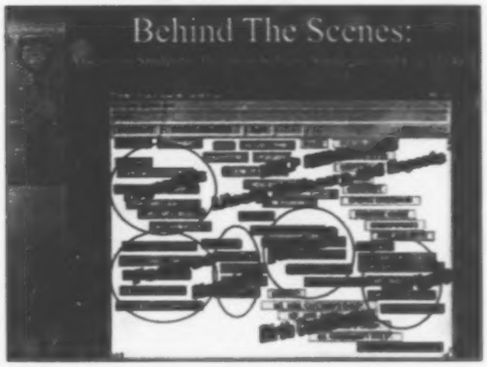
Search Path Map



Integrating IMMEX into the Classroom VIII.



Integrating IMMEX into the Classroom IX.



Behind The Scenes:

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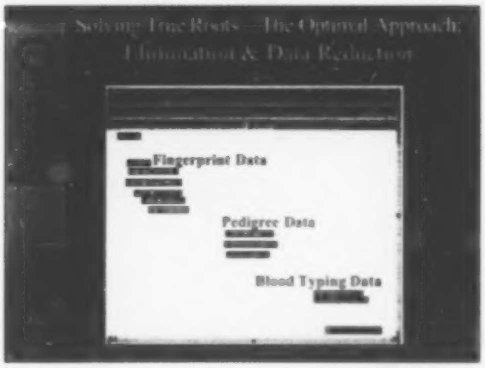

Solving True Roots — The Optimal Approach: Elimination & Data Reduction

Fingerprint Data
Pedigree Data
Blood Typing Data

Rank the Strategy Activity

UCLA IMMEX STAFF

Ron Stevens, Ph.D., Project Director

IMMEX Software Development Laboratory

Web Site: [illegible]

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GLENN LEARNING TECHNOLOGIES PROJECT

NASA

http://www.lerc.nasa.gov/WWW/K-12

Aeronautic Educational Resources

Beginner's Guide to Aeronautics

- Beginner's Guide to Aerodynamics
- Beginner's Guide to Propulsion
- EngineSim
- FoilSim

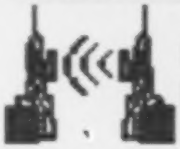
Aeronautics Lessons and Activities

- Aeronautics Activities
- Rocket Activities
- Wind Tunnel Experiments for Grades 8-12

FREE SOFTWARE!!!

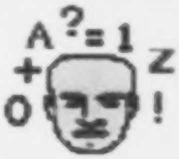
- FoilSim
  - Download and Installation Instructions
  - Manual and Problem Sets
- National Math and Science Standards

Educator Resources



Distance Learning

- Report on Distance Learning Survey Results
- Student/Teacher Videoconferencing Workshops
- WVIZ/NASA Educational Channel
- NASA Distance Learning



Proficiency Skills

- Proficiency Resource List
- 9th Grade Math Practice Exam
- Links to Online Sites to Improve 9th Grade Science Proficiency

Teacher Created Web Pages

Summer Workshop Projects

Internet Access Research

Wireless LAN

Whitney Young Middle School
Wireless LAN Project

Digital Audio Testbed

Live Cybercast

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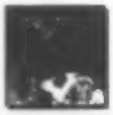
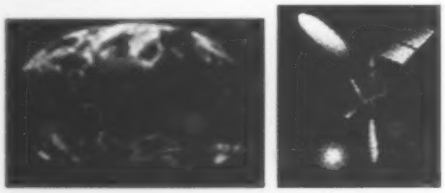
NASA Glenn Distance Learning Program

Ruth Petersen
Ruth.A.Petersen@grc.nasa.gov

http://www.grc.nasa.gov/WWW/K-12/CoE.Coemain.html

Descriptions of Student Presentations

General Topic	Presentation Title	Grade Level
Aeronautics - Space Transportation	Aeronautics; High Speed Flight; Incredible Lever, The	K-12
	Aircraft Safety and Icing Research, Meet a NASA Employee Involved in Aeronautical Research	7-12
	Introduction to EngineSim, Introduction to FoilSim, Topics in Aerodynamics and Propulsion, Tours of NASA Glenn Research Center Facilities	5-12
	History of Humans in Space, History of Rocketry	4-12
	Propulsion	4-6
Human Exploration and Development of Space	Human Exploration and Development of Space, Human Exploration of Mars and the Solar System	K-12
	Advanced Space Propulsion Concepts	9-12
	Humans to Mars, Exploring Mars: Parts 1-5	4-12
Earth Science	Mission to Planet Earth	K-12
	Space Communications Office Workshop Series (The workshops are listed in the order in which they are to be presented.): Introduction to Telecommunication Concepts, Two Forms of Electronic Communications, Getting More Users on a Single Telecommunications System, Networks and the Internet, Satellites and their Orbits, and Satellite Communications.	9-12
Space Science	Mars; Moon, The; Scaling the Cosmos; Space Science; Space and the Solar System; World of Robots, The	K-12
	Elements of Space	K-6
	Energy from the Sun	9-12
	Comets	5-8
	Travel to Distant Stars	5-12
	Cassini Mission to Saturn, Exploration of the Solar System, Galileo Mission to Jupiter, Space Questions	4-12
Miscellaneous	Fermi's Piano Tuner - Making Estimates in Physics; Have You Looked at Your Calendar Recently?; Mathematics: Science of Numbers	9-12

Teacher Workshops

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The following workshops are offered for grades 3-12 math and science teachers:

- Introduction to Aerodynamics and FoilSim
- Introduction to Propulsion and EngineSim
- Using NASA Educational Internet Sites in the Science Classroom.

Registration Information

1. At least four weeks before the video conference, complete the online registration form.
2. Videoconferences for students can be scheduled Monday through Friday during the regular school day, Eastern Standard Time (EST). Mornings are the best time to schedule student videoconferencing workshops. Teacher workshops are normally scheduled at the close of the regular school day, but they may be scheduled at other times upon request.
3. Videoconferences are scheduled on a first-come, first-served basis. All events are subject to cancellation pending adequate registration. Video conferences may be preempted by official NASA programs.
4. Preference is given to consortiums with three to four sites participating.
5. NASA Glenn does not charge a content provider fee for the workshops. In order to continue the program, however, fees may have to be charged in the future.
6. A test connection with NASA Glenn should be scheduled for first-time participating sites. Ruth or Carol will make arrangements for a test connection.
7. You will be expected to place the calls to connect to the NASA Glenn videoconferencing room for the test and the presentation.
8. If necessary, notify your videoconferencing network provider of the conference and schedule the time. Allow time to connect and test the connection at the beginning of the videoconference and for questions from participants at the end.
9. Participants are asked to complete an online evaluation form at the close of the videoconference.
10. To register for a conference, please complete the online registration form.

For additional information contact:

Ruth Petersen at Ruth.A.Petersen@grc.nasa.gov or (216) 433-9714, or
Carol Galica at Carol.A.Galica@grc.nasa.gov or (216) 433-5112.

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The Kids are Running the School, School Network that is!

**Presented
by
Charlanne Pook
District Technology Coordinator
Jessamine County Schools
cpook@jessamine.k12.ky.us
and
Barbara Barr
Technology Integration Specialist
Jessamine County Schools
bbarr@jessamine.k12.ky.us**

Opportunities for All Ages

Activities in which our students participate:

Infrastructure

Technological

Preventative Maintenance
Trouble Shooting
Repairs
Phone Support

KTLN/CenterNet (Video Tele-conferencing)

Special Projects

Authentic involvement

Training

Manuals
In-Service
Just In Time Training

Planning and Organization

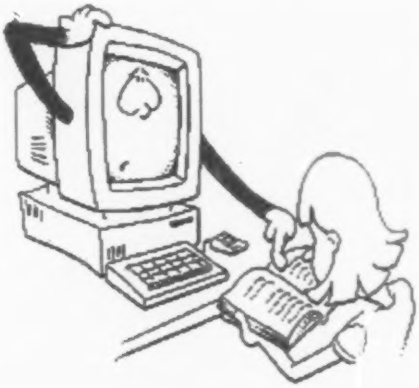
Planning Meetings
Meet with vendors
Make arrangements
Office assistance

Structuring the Helpdesk Program

- Begin with the end in mind!
- Planning
- Rules/guidelines
- Real world work experience
- System of checks and balances
- Flexibility
- Building process
- Student Handbook
    - General Information
    - Responsibilities
    - Day to Day
    - Contacts
    - Purchasing
    - Personal Growth
    - Technical Procedures

Jessamine County Schools
District Technology Office
Hiring Procedures

- Student employees must be recommended by a teacher or staff member.
- Student must be a member in good standing with their school STLP.
- Students must fill out an application.
- Student must get 2 letters of recommendation.
- Student must submit application, resume, and letters of recommendations to the District Technology Office.
- Student must schedule an interview.
- Student must attend orientation training.



Jessamine County Schools
District Technology Office
Expectations of Student Workers

- Keep a weekly time sheet
- Check email daily as most information is relayed this way.
- Adhere to school dress code
- Be pleasant to co-workers and visitors to the District Technology Office
- Keep a portfolio of their work
- Clean up after themselves
- Attend training sessions
- Call if unable to work at a scheduled time
- Always be courteous and professional in each work environment

---

Jessamine County Schools
District Technology Office

Student Work Procedures

Procedure Upon Arrival at Work:

- ◆ Check in with the Help Desk Coordinator
- ◆ Check work folder for the specific school where you will be working that day
- ◆ Look over Help Desk Tickets to make sure you understand the specific problems to be addressed.
- ◆ Check with MAC or PC technician to explain what you would do to solve each Help Desk ticket.

Work Procedures:

- ◆ When you arrive at the school, remember to check in with the STC/TRT.
- ◆ Introduce yourself to the teacher/staff in the room/office where you are working.
- ◆ Be willing to call from individual schools to receive additional technical support for problems.
- ◆ Upon completion of the work assignment, explain to the teacher/staff what was done.
- ◆ If the problem cannot be resolved, explain the next step or action.
- ◆ Clean up after yourself and put things back!
- ◆ Before proceeding to the next Help Desk Ticket, write a detailed explanation of the steps taken to resolve the problem.
- ◆ Upon returning to the District Technology Office, report each specific problem you worked on or the specific steps which need to be taken to complete the job.

Empowering Teachers Through CFBISD's Technology Integration Academy

Carrollton · Farmers Branch
Independent School District

NECC 2000 Presentation

by

CFBISD's Instructional Technology Specialists
(LaDonna Conner, Barbara Hunt, Jan Jaeger, Karin Porter)

- NECC PowerPoint Presentation
- TIA Resources
  - Proposal

- Faculty Introduction of TIA PowerPoint Presentation
- Application Cover Sheet
- Application
- Application Evaluation Rubric
- Request for Donations Letter

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What is the Learning Cycle ?

The learning cycle consists of three instructional phases.

Exploration Phase
  1. The students work in cooperative groups of two to five individuals.
  2. The students are provided instructions to follow, or a problem to solve.
  3. The students actively manipulate materials, make observations and predictions, gather data and information.

B. Concept Invention or Term Introduction Phase
  1. The teacher asks a series of "guiding" questions (verbal, written) that lead students to discovering the main idea(s) of the activity.
  2. Students discuss then write this "idea" as a group.
  3. Students present their group idea to others, verbally or on the board.
  4. Using students' explanations and/or drawings, the teacher points out or asks students to indicate similarities among the responses from the groups. The teacher allows discussion to take place and allows groups to change explanations if they wish.
  5. With teacher assistance, the class comes to consensus using their own language. The teacher writes the class idea for all students to see and record.
  6. The teacher provides the term(s) for that concept/idea that the students invented.

C. Expansion or Application Phase
  1. This phase is completed to help students organize the new idea they have invented with that which they already know (i.e., connect/attach thought with thought).
  2. Activities in this phase could include almost anything (further experimentation, projects, Internet searches, videos, presentations, writing, etc.).
  3. The expansion helps students connect new ideas with occurrences in their everyday lives

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Planning a Learning Cycle

Planning for student exploration

Students must have concrete materials and experiences if they are to learn concrete concepts. Abstract concepts are largely inappropriate, even with concrete materials, until at least age 15 for most pupils.. Use these guiding questions:

- What do I want the children to learn? (goals, objectives, attitudes, processes, products)
- What concept(s) will be invented?
- What activities must the students do to find and to construct the needed data?
- What kinds of records should the students keep?
- What kinds of instruction and encouragement will the students need?

Planning for concept invention

The main purpose of this phase is to reach mental equilibrium through accommodation, as described in the theory of Jean Piaget. Here the students must focus on their primary findings from the exploration, and the teacher must assist them by introducing proper language or concepts labels. The teacher's task is to lead students through a discussion (individually, small group, or whole class) so that students can discover the concept by inventing it for themselves. The teacher's technique is to question skillfully so that students use the experiences of their explorations to construct scientific meaning. The teacher acts as a facilitator and introduces any special vocabulary that must accompany the concept. Plan this step carefully so that it remains a student-centered activity, lectures must be minimal. Use these questions as you plan for this part of your lesson:

- What kinds of information or findings are students expected to provide?
- How will the students' findings from the exploration phase be reviewed and summarized?
- How can I use the students' findings and refrain from telling them what they should have found, even if they are incorrect or incomplete?
- What are the proper concept labels or terms that must be attached to the concept?
- What reasons can I give the students if they ask me why the concept is important? (This question leads to the next phase: Expansion)

Planning for expansion

The purpose of this phase is to help students organize their thinking by applying what they have just learned to other ideas or experiences that relate to the lesson's concept and to assist the students in expanding their ideas. It is very important to use the language of the concept during the expansion of the idea phase. Plan this phase for student involvement. Consider using these questions to guide your thinking:

- What previous experiences have the students had that are related to the concept? How can I connect the concept to these experiences?
- What are some examples of how the concept and the activities encourage the students' science inquiry skills?

- What examples can be used to illustrate the interrelationship of science and technology and the contributions of each to society and the quality of life?
- In what ways has science benefited the students personally?
- What are examples of how science has influenced our society, policies, and laws?
- What have been the dominant ideas of science throughout recorded history, and how have those ideas and the nature of science changed over time?
- What new experiences do the students need in order to expand on the concept?
- What is the next concept related to the present one? How can I encourage exploration of the next concept?

Planning for evaluation

Go beyond standard forms of testing. Learning must occur in small increments before larger leaps of insight are possible. Your evaluation can be planned in terms of outcomes and pupil performances. Several types of records are necessary to form a holistic evaluation of the students' learning and to encourage conceptual understanding as well as process skill development. Continual evaluation is needed, not just end-of-chapter or end-of-unit testing. Evaluation can occur at any point in the lesson. Consistent evaluation can help reveal misconceptions before they become deeply rooted. Ask yourself:

- What key questions should I ask to encourage deep exploration?
- What questions can I ask to help students think about their data in an effort to construct realistic concepts?
- What questions will expand conception and achieve several science goals?
- What behavior (mental, physical, attitudinal) can I expect from the students?
- What hands-on assessments can the students do to demonstrate the basic skills of observation, classification, communication, measurement, prediction, and inference?
- What assessments can students do to demonstrate the integrated skills of identifying and controlling variables, defining operationally, forming hypotheses, experimenting, interpreting data, and forming models?
- What pictorial assessments can students do to demonstrate how well they can think through problems that require both knowledge and the integration of ideas?
- What reflective question assessment will indicate how well the students recall and use what has been learned?

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Technology Self-Report **Name** ______________________________

Computer Skills

Following is a list of general computer skills which would be useful for success in technology-integrated instruction. Read each item and check the response which describes your skill.

I can:	**Yes**	**No**	**Unsure**
1. Start up, reboot, and shut down a computer			
2. Start and quit a program stored on the hard drive			
3. Save, copy and retrieve files to and from a floppy or the hard drive			
4. Save the same file in more than one version			
5. Open and close menus and windows			
6. Move and resize windows on your desktop			
7. Navigate a directory structure to find files			
8. Type at least 40 words a minute			
9. Create a word processing document			
10.Print a word processing document			
11.Use spell checking to help revise my work			
12.Cut/copy text from one document and paste it onto another			
13.Use a projection device to show and share computer output			
14.Cut/copy text from one application to another			
15.Log onto the local network			
16.Retrieve and delete e-mail messages			
17.Create, send, forward and reply to e-mail messages			
18.Distinguish between an e-mail address and a web address			
19.Send e-mail to a group			
20.Post messages to online discussion lists or bulletin boards			
21.Locate and access information using WWW search tools			
22.Apply common online etiquette, rules and safeguards			
23.Check the credibility of Internet resources			
24.Save and manage a list of favorite web addresses			
25.Use the online catalog system in the library			

Computer Resources

This section asks about the computer resources which are available to you at home and at work.

26. Which of the following describes your home computer? (check if sure; ? if not sure; blank if no)

___Do not have home computer
___Computer has modem
___Computer has CD ROM Drive
___Computer has sound card & speakers
___Computer has printer
___Phone line available to computer
___Connected to Internet Service Provider
___My e-mail account is accessible there

27. Which of the following describes your workplace computer? (check if sure; ? if not sure; blank if no)

___Do not have workplace computer
___Computer has modem
___Computer has CD ROM Drive
___Computer has sound card & speakers
___Computer has printer
___Phone line/network line available to computer
___Connected to Internet Service Provider
___My e-mail account is accessible there

Learning about and with Technology

Please circle the letter of the response which best describes you.

28. When I am asked to use software or technologies that I haven't used before:

    a. I look forward to it.
    b. I feel apprehensive, but try anyway.
    c. I put it off or try to avoid it.

29. When learning new technology, I believe I learn best:

    a. when I can listen to an explanation or see a demo first.
    b. when I can read manuals or written materials first.
    c. by trial and error and discovery.

30. I prefer learning:

    a. on my own.
    b. with a peer or two.
    c. as part of a group led by an instructor.

Open-Ended Response

For what do you currently use a computer in your home and workplace?

Philosophy

Virtual Explorers' *Amazon River Dolphins* promotes and supports science investigation in a project-based learning environment. The website is geared for grades five through eight, although elements are applicable in primary and secondary classrooms.

Teachers worldwide are provided with experience in web-delivered instruction, enabling them to facilitate an active and meaningful learning experience in their own classrooms.

Students benefit from learning scientific observation and research skills, helping them to develop their own understanding and appreciation of biodiversity and conservation.

Special emphasis is placed on females as role models and leaders in science and technology.

A free and safe website

The Virtual Explorers website
- is free.
- doesn't require passwords.
- has no advertising banners on its pages.
- uses guest book e-mail addresses only for updates.
- links only to teacher-approved sites.

www.virtualexplorers.org

Original watercolors by Mary Brown

Five sections enhance interdisciplinary study

Getting Ready

- Meet the team, volunteers, and researcher.
- Learn about the extensive expedition preparation, including necessary travel papers, vaccinations, equipment and clothing.

River Dolphins

- Read what scientists already know about river dolphins.
- Find out what new information the researcher hopes to gain in her ongoing study.
- Draw your own conclusions from the data collected and posted to the website during the expeditions.
- Learn about the Pacaya-Samiria National Reserve and what a unique place it is.

Daily Highlights

- Identify the quickly surfacing boto from tuxuci dolphins using QuickTime video.
- Experience village life along the river through extensive photos and QuickTime.
- View 360° of an Amazon tributary through QuickTime VR.
- Follow the adventures from start to finish through the daily log.

Peru and Its People

- Find out about the history of Peru, its people and how their ancient culture influences their lives today.
- Meet the Peruvian crew of the research boat.
- Read the myths of the river people.

Taking Action

- Learn how people can make a difference by becoming involved in their local and global communities.
- Take action and initiate change in your local community using the provided resources.

Join us as we learn about Amazon river dolphins.

Virtual Explorers' initial trip in August of 1999 with researcher Tamara McGuire aided in a conservation effort and study of the elusive Amazon river dolphins. Archived data, photographs and video are currently available to students and teachers on the website.

A second expedition is planned for November 13–24, 2000. Once again, the team will daily post research, travel updates and photos live via satellite phone.

Meanwhile, Tamara is continuing her dolphin research in Peru through the EarthWatch Institute. Her data, research findings, and journal entries will continue to be posted on the website.

Peru and General Area
Colombia
Brasil
Pacific Ocean
Bolivia
Chile

www.virtualexplorers.org

Virtual Explorers
109 Clement St. #2
San Francisco, CA 94118

Come join us ...

... as we explore the world

www.virtualexplorers.org

Educators using technology to explore, discover, and share the world with students and teachers everywhere.

Van Walleghan, Pam

- Unity in Community: Urbana Middle School - University of Illinois
- Original Author Submissions

Wagner, Hazel

- Starship School: Creating productive, safe, family-oriented educational communities
- Original Author Submissions

Wall, Mary

- Quality in Distance Education Courses: A C.A.S.E. Study
- Original Author Submissions

Walts, Jennifer

- Wired for Success: A Cross-Curricular Collaboration
- Original Author Submissions

Warlick, David

- ClassWeb: Cultivating the Internet for Learning
- Finding it on the Net
- Teacher-Crafted Educational Web Environments: ClassWebs (pdf format)
- Finding it on the Net: Being a Digital Detective (pdf format)
- Original Author Submissions

Webb-Upham, Michelle

- Technomaniacs
- Original Author Submissions

Weller, B. Jean

- Agenda
- Evaluation Checklist for Internet Projects
- Resources Checklist
- Original Author Submissions

Wininger, Denaya

- Creating Virtual Tours With QuickTime Virtual Reality
- Creating Virtual Tours With QuickTime Virtual Reality: List of Resources
- Original Author Submissions

Wissick, Cheryl

- Developing multimedia tools to support functional and community training

QuickStarts: Web Toolboxes to Support Technology Integration
Original Author Submissions

Woytonik, Marlene

Little Village to Global Village: Chicago, Illinois
Original Author Submissions

Yohe, Paula

Technology Creates Enthusiasm For Reading! (pdf format)
Original Author Submissions

Zaorski, Agnes Patterson

Videoconferenced POW-WOWs With Native American Keypals: Online Culture Sharing
WOW-KITE Keypals & Videoconferencingpals
Keypals Correspondence Template
WOW-KITE Videoconferencingpals Lesson Plan
Original Author Submissions

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Unity in Community

Urbana Middle School - University of Illinois

1998 Apple Education

<http://www.cmi.k12.il.us/Urbana/projects/apple/index.html>

The "Unity in Community" project is a collaboration between the College of Education at the University of Illinois at Urbana-Champaign and Urbana Middle School. The goal is to use service learning and computer technology to create a student centered, project based curriculum. Students, teachers, and pre-service teachers will: (a) move the nexus of learning from the classroom to the community; (b) act as agents of positive change in the community; (c) use technology as the integral connection between all phases of the program; and (d) create a web based clearinghouse of service opportunities in the community.

Service Learning

Service -- Students provide valuable services to their community; and

Learning -- Students reflect on that experience in structured ways that enhance their learning.

Some key elements:

- Young people themselves are involved in planning an jd leading the effort
- They are involved in important work that makes a difference for the community, the agency, and the young people themselves
- Their service experiences contribute to and are enhanced by their academic learning and personal growth

For more information about service learning, contact:
The Close-Up Foundation <http://www.closeup.org/servlern.htm>

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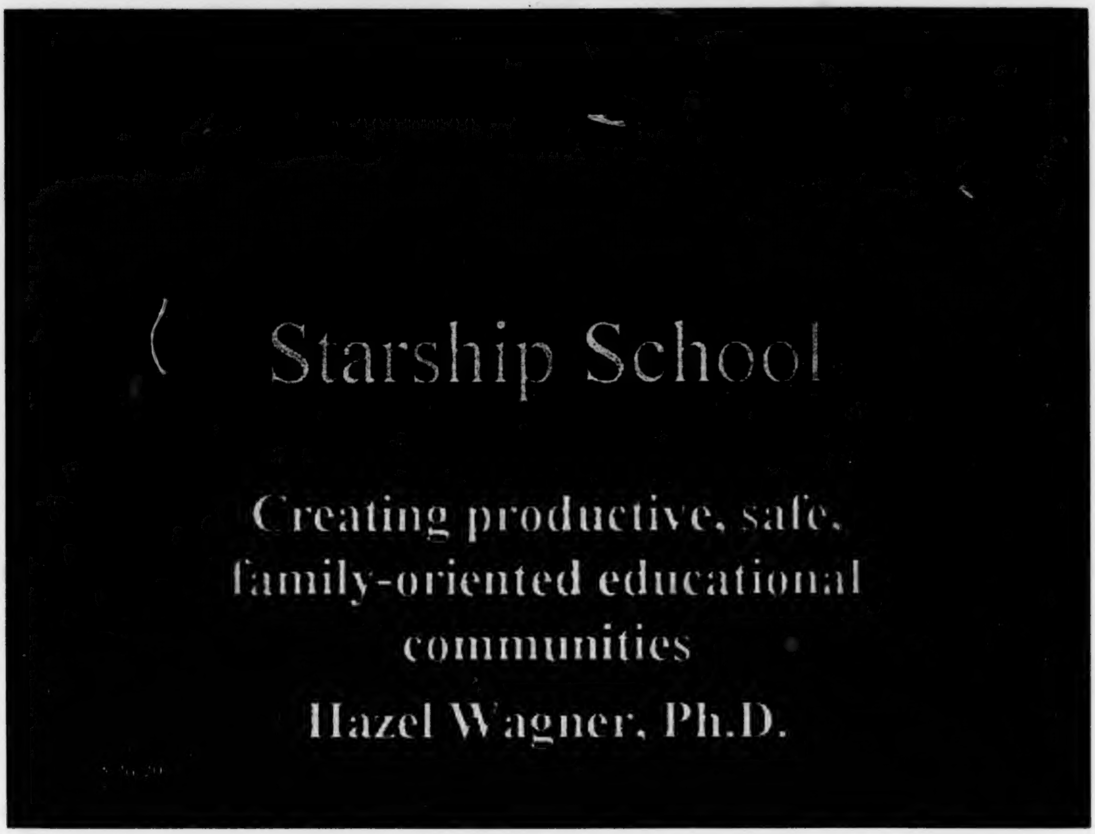

Starship School

Creating productive, safe, family-oriented educational communities

Hazel Wagner, Ph.D.

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Quality in Distance Education Courses: A C.A.S.E. Study

Dr. Mary Wall, Dean of Academic Computing and Distance Education
wall@atlantic.edu
Dr. Joyce Grohman, Dean of Instruction
Grohman@atlantic.edu

Atlantic Cape Community College
Mays Landing, NJ http://www.atlantic.edu

C	**Collaboration** · Faculty to faculty · Faculty to student · Student to student · College to college	Faculty mentoring Collaborative assignments such as: · Debates · Group work · Discussions One-day workshops on online teaching
A	**Assessment** · Academic integrity responsibility of the academic department · Quantitative assessment · Qualitative assessment	Types of quantitative assessment · 1-5 scale student evaluation of instruction · Student evaluation of technology · Student success rate Types of qualitative assessment · Ethnographic studies · Written student comments
S	Student Support · Admissions · Dean of Students · Dean of Institutional Support · Dean of Academic Computing and Distance Education	Admissions: · Online admissions Dean of Students: · Online registration · Online advisement · Online counseling Dean of Instructional Support · Placement tests · Proctoring tests · LibraryDean of AC & DE · Technology support · Contact person for online students

E	**Encouragement and Support of Faculty** · Before courses are put online · While teaching online	Before putting courses online: · Instructional technologists · Software such as WebCT and FirstClass While teaching online: · Class size limit of 20 · First time classes not more than 15 · Clerical help

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Wired for Success:
A Cross-Curricular Collaboration

Presented by: **Dr. Sharon Joiner, Media/Technology Director**
sjoiner@infoave.net

Liberty County School System
County Technology Office
Lewis Frasier Middle School
910 Long Frasier Street
Hinesville, GA 31313

Jennifer Walts, Media Specialist
jwalts@liberty.k12.ga.us
Regina Baker, Fourth Grade Teacher
rbaker@liberty.k12.ga.us
Cathy Lane, Second Grade Teacher
clane@liberty.k12.ga.us

Liberty County School System
Taylors Creek Elementary School
378 Airport Road
Hinesville, GA 31313

Our Research: "Why bother?"

Information literacy is here to stay.
National Education Technology Standards have been established
They can be seen at:

http://www.iste.org
International Society for Technology in Education

The proposed technology QCCs are at
http://www.glc.k12.ga.us
Georgia Learning Connections

Research studies have proven that incorporating technology into the curriculum helps teachers shift education from:

1. linear to non-linear
2. instruction to construction
3. teacher-centered to student-centered

4. knowing the answer to finding the answer
5. memorization to life-long learning
6. total group to customized instruction
7. ho-hum to fun

Our Timeline: "No, it didn't happen overnight!"

1994: Model Technology Grant

1995: The "Dream Big" five-year technology plan.

1996: Farallon Grant provides Internet connectivity throughout the building.

1997: The E.L.I.T.E. (Enriching Learning through Implementing a Technologically-rich Environment) project was born. This project has moved Taylors Creek forward in our efforts to seamlessly infuse technology into all areas of instruction.

1999: Vanguard classrooms with trained teachers have served as model technology environments. We are better able to use what we have and to perceive technology as a tool.

Our Collaboration: "You take the high road, I'll take the low road, but we'll get there faster together!"

The role of the teacher
The role of the media specialist
The role of the technology specialist

Our Ideas: "Yes, two brains ARE better than one."

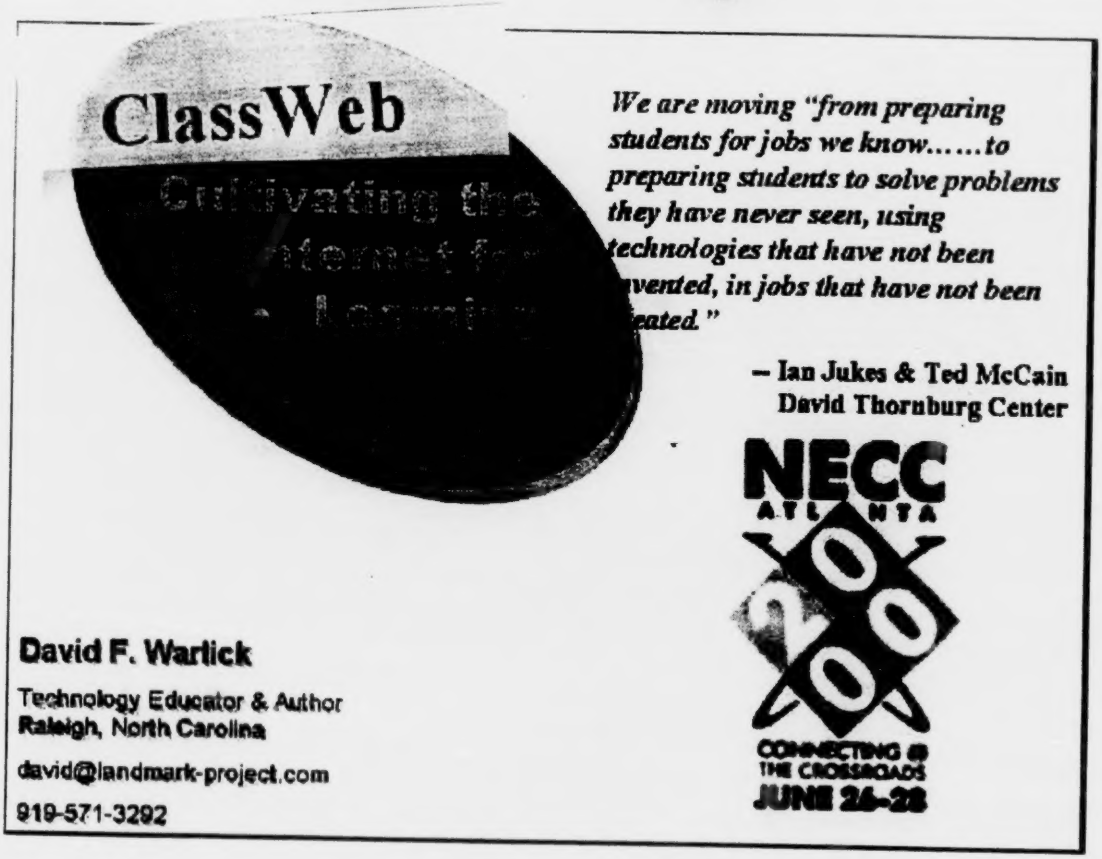
Planning and collaboration are cornerstones of success. Technology can fit into all areas of the curriculum. The key is to write the lesson first and then fit the technology into those places where it enhances the instructional design. Technology is NOT always the best way to go, but in many instances it will "Bring Learning to Life!"

Our Proof: "A picture is worth a thousand words. A video is worth a billion."

This is technology in action. The following samples will help you remember all the exciting, yet simple, ideas you have seen and heard about in the session.

Notes:

Click to open author's original document.



ClassWeb

Cultivating the
Internet fo
- Learnin

We are moving "from preparing students for jobs we know……to preparing students to solve problems they have never seen, using technologies that have not been vented, in jobs that have not been eated."

– Ian Jukes & Ted McCain
David Thornburg Center

NECC
ATLANTA
2000
CONNECTING @
THE CROSSROADS
JUNE 26-28

David F. Warlick

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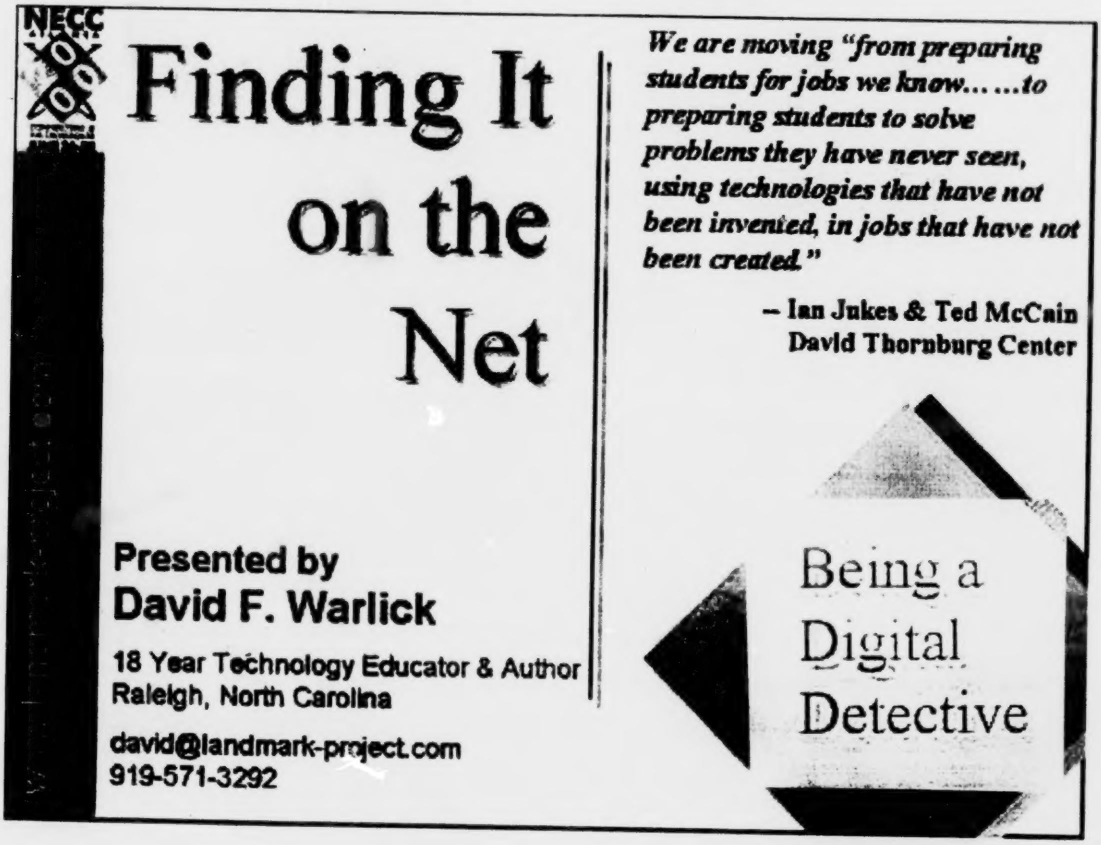

Finding It on the Net

Presented by
David F. Warlick
18 Year Technology Educator & Author
Raleigh, North Carolina
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919-571-3292

We are moving "from preparing students for jobs we know……to preparing students to solve problems they have never seen, using technologies that have not been invented, in jobs that have not been created."

– Ian Jukes & Ted McCain
David Thornburg Center

Being a Digital Detective

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Teacher-Crafted
Educational Web Environments

ClassWebs

By David Warlick
August 17, 1999

Problems

What is the Internet's place in K-12 education? This question is often asked and often answered by school administrators, teachers, parents, and government officials. The question comes from the needs to finance the infrastructure that pipes the Internet into classrooms, media centers, and computer labs; the cost of maintaining that infrastructure; and the need to help educators learn to use and utilize the technology.

The answer varies depending on the media's latest twist, the grade level being addressed, and the level of knowledge, experience, and the level of imagination of the person considering these questions. It is essential for anyone who attempts to answer this question to understand the puzzle into which we are trying to fit this brand new technology.

First of all, our teachers are managing classrooms of 20 to 30 (and sometime more) students, each an individual with unique experiences, intellectual strengths and weaknesses, and styles of learning. Teachers are charged with assuring that each student exits the classroom at the end of the year with specific skills and knowledge as described by state or local standards and capable of applying those skills and knowledge in real world situations. Increasingly, teachers are also being asked to prepare students to take high stakes tests, which determines the school's ranking, teacher pay bonuses, or whether the state takes over the school.

With this much being asked of our teachers, the puzzle that makes up their classroom leaves little room for broad nebulous technologies no matter how impressive and global they are. This is especially true when the technology also presents the teacher with a new set of problems and challenges to address, including:

- Evaluating information from the Internet
- Supervising student use of the Internet to protect them from offensive or otherwise inappropriate information
- Protecting each student's identity on the Internet
- Precious time that is often wasted surfing the net for information
- Dealing with brand new plagiarism and copyright issues.

Classroom Web Sites

In order for the Internet to fit positively and productively in the busy and over stressed classroom, it must be reshaped to fit in where it is needed. It must be molded and packaged to meet the needs of the students, the demands of the curriculum and the instructional style of the teacher. If a teacher can shape the Internet to meet specific needs, then it can become a mortar that can hold together those puzzle pieces, making a seamless learning environment. A tall order, admittedly.

It is almost rare to find a school district or even school without a web site. Nearly half of the workshops I have been asked to teach during the past four years have been for teachers and school administrators who want to build a web site for their school institution. Class web sites designed for students to use have been slower to appear, the rare ones created by a few techno-enthusiastic teachers. There are several reasons why Class web sites have been slower to appear:

- Few teachers have the skills to create and maintain a class web site.
- Few school districts provide web space for class web sites.

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- The class web site, when designed for students use, does not easily fit into the model of most institutional sites, making it more difficult to visualize what it might look like or how it might be used.
- The potentials benefits for creating effective learning environments have not been openly or thoroughly explored.
- To many students do not have access to the Internet at home in order to take advantage of class web sites.

Perhaps the last issue in the list above should be addressed first. Assuring equitable access to technology is a vital concern for educators and for society. However, a question we as educators must start asking is, when is the access sufficient that we can start relying on the Internet outside of the school and school day for teaching and learning?

In the 50s and 60s many homes had their own encyclopedias, but certainly not all homes. Students were still expected to conduct outside research regardless of their access to book. If you didn't have the resources at home for your research, then you were expected to go to the public library, or you arrived at school early or stayed late to use the school's library.

Here in Raleigh, North Carolina, every forth grade teacher in the city assigns their students to do a special project on one of North Carolina's lighthouses. The assignment is made at pretty much the same time every year. I can attest to the fact that there are not enough books in this city about lighthouses to go around to every forth grader in Wake County. However, with the emergence of web sites about this state's lighthouses, access has become much greater, and probably more equitable, regardless of who has computers at home.

There is much said and discussed today about distance learning – using computers and the Web to span distances between the teacher and students. However, there are also distances within the classroom to be covered, sometimes vast distances between student and curriculum. Teacher designed and constructed web sites may provide a way of spanning those distances by aligning selected and linked web resources, with powerful collaborative tools, and with standard courses of study.

Many teachers are still confounded by what exactly their students should be doing at their Internet-connect classroom and lab computers. They know and use the World Wide Web and e-mail, but have not moved beyond think of the Net in they classrooms for anything other than a fancy encyclopedia. A teacher-constructed class web site can give students a place to start that is designed to send them to specific Internet resources within the context of the class goals and the real world application of the available knowledge and skills. This context would take the form of text, images, and other media that is embedded in the web page and wrapped around the information that they are accessing.

Assuming agreement with these conclusions, the time has come where educators can start constructing learning environments for their students through classroom web sites.

What is a ClassWeb?

A ClassWeb is a web page or web site constructed by a teacher (or other educator) to help his or her students learn specific curriculum content and skills. ClassWeb can be extremely flexible in design and construction, but they should:

- Utilize the unique qualities of the Internet – rich information resources, collaboration, contributive expression,
- Proactively point the student toward educationally appropriate Internet resources,
- Provide for workspace for students to conduct their work, preferably interactive space,
- Provide a context for what the student is learning,
- Be constructed more easily and in less time than it takes to prepare a paper work sheet.

There are three aspects of using the Internet that are especially suited to help teachers teach and students learn.

- Rich & Interactive Information Resources
- Collaboration

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- Contributive Expression[1]

Rich & Interactive Information Resources

The Internet represents a vast amount of information on nearly any topic imaginable, and probably some topics that you and I probably wouldn't imagine. This vastness of information is part of the problem faces teachers as they try to integrate the Net into their curriculum. It can take students precious time to find the resources that they need, time that is not necessarily productive and is certainly inefficient.

A teacher constructed ClassWeb can help make the student's time on the Internet more efficient and productive by providing links to specific web resources identified, evaluated, and selected by the teacher. If a goal of the assignment is for students to conduct an Internet search, then links can be provided to the appropriate search engines and tips embedded in the page that helps the student develop search strategies that will end up with the desired outcome.

In conclusion, providing students with links to specific Internet resources through a teacher-constructed ClassWebs affords these advantages:

- Saves valuable time for the student and teacher.
- Dramatically decreases the chance that students will uncover offensive, unhealthy, or otherwise inappropriate web pages.
- Provides students access to web pages that have been previewed and selected by the teacher for specific instructional objectives
- Allows the teacher to logically sequence the links based on the instructional objectives.
- Perhaps the most important benefit of teacher-designed web link pages is the fact that the teacher can provide a context for the web resources. The hyperlinks can be preceded and followed by text, images, and other media that packages the web resources specifically for the instructional objectives of the activity.

Collaboration

If you use the Internet, then you collaborate. It may be through e-mail, newsgroups, discussion forums, chat rooms, or other collaborative tools, but one of the most important things that people do on the Net, it communicate with other people. With ClassWebs, teachers can create web pages that either link to collaborative tools or embed the tools directly into the page. In the same way that a teacher might have students gather into small groups for cooperative learning activities, the teacher might gather students through a chat room or message board to work together on an activity.

In very much the same way that the web links have been wrapped in context, the students' collaborative work space would also be surrounded by texts, images, and other media that connects the activity to the curricular objectives and to real world applications. In exactly the same way that teachers can surround web links with context, they can also assign students to collaborate over the Internet within the context of curriculum objectives.

Participating in online collaborative activities has several advantages over face-to-face collaborations.

- It is difficult to measure student's participation in face-to-face discussions. Online discussions can be easily measured because the entire discussion is archived. Both the quality and the quantity of the participation can be measured and graded. The teacher might say that one original article and two responses to other articles will earn a "C", two original articles and three responses will earn a "B", etc.
- Since students have time to reflect and craft their responses, shy or otherwise reluctant students are more likely to participate with more confidence.
- Perhaps the most important benefit of online discussion is the fact that students can reflect on the information before sharing their perspectives. They can also craft their responses

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[1] Warlick, David. "Raw Materials for the Mind: Teaching & Learning in Information & Technology Rich Schools." The Landmark Project. 1999.

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using word processing features. In processing their ideas through written texts, students can become more fluent in the concepts than keeping up with an oral collaboration.

Self-Expression

One of the earliest lessons that we learned about students using e-mail was that they write better when writing to an authentic audience. This might have been a keypal, or a distant classroom, or increasingly broad audiences through student-created web pages. ClassWebs can facilitate opportunities for students to express themselves in a contributive way by providing venues for writing and even uploading other types of files such as art work, maps, diagrams, and other media.

ClassWebs

ClassWebs are web sites created by teachers for their students. They create virtual learning spaces for students that provide access to selected information, encourage collaboration with peers and experts, and include opportunities for students to express their knowledge and experience to authentic audiences.

ClassWebs are unlike paper based learning activities (work sheets). They leverage technical and application aspects of computers and the Internet that are not possible on paper, such as virtually limitless access to information, collaborative working space, and virtual access to the activity by the teacher.

ClassWebs are unlike traditional web-based activities. A growing virtual library of dynamic and effective educational web sites is appearing on the Internet. However, these sites are developed by people who do not know your students, the scope and sequence of your classroom, nor your teaching style. ClassWebs remember that teachers are the instructional leaders of our classrooms, and empowers them to fully utilize the Internet for their students.

ClassWebs are unlike traditional interactive classroom activities. The Internet transcends space and time. Students can participate in the activity within the same room at the same time, or they can work together from their own homes or other locations, benefiting from ongoing monitoring and support from their teacher(s).

An Example

A seventh grade social studies teacher is bringing closure to a unit on China. He has introduced Confucius on several occasions during the unit. As a final activity, he assigns students to scan some of the *Analects* of Confucius, which are saying either directly attributed to him or to others who taught Confucian philosophy after his death. Each student is asked to select one or more of the Analects and then write a short essay (one or two paragraphs) that describes how the idea relates to today's society.

As a ClassWeb, the assignment would take the form of a web page, which begins with an introduction that sets the context of the students' work. Then clear instructions are included in appropriate places on the page. The web page also links to a web site(s) that include the information being considered, the Analects of Confucius. Finally, a work space is provided. In this case, students are asked to use a discussion forum or message board. They are each asked to post at least one original articles describing how their Analect applies to contemporary society. Finally, students are asked to respond to at least two articles posted by classmates, expanding on their ideas. On the next page is an image of how such a ClassWeb might look.

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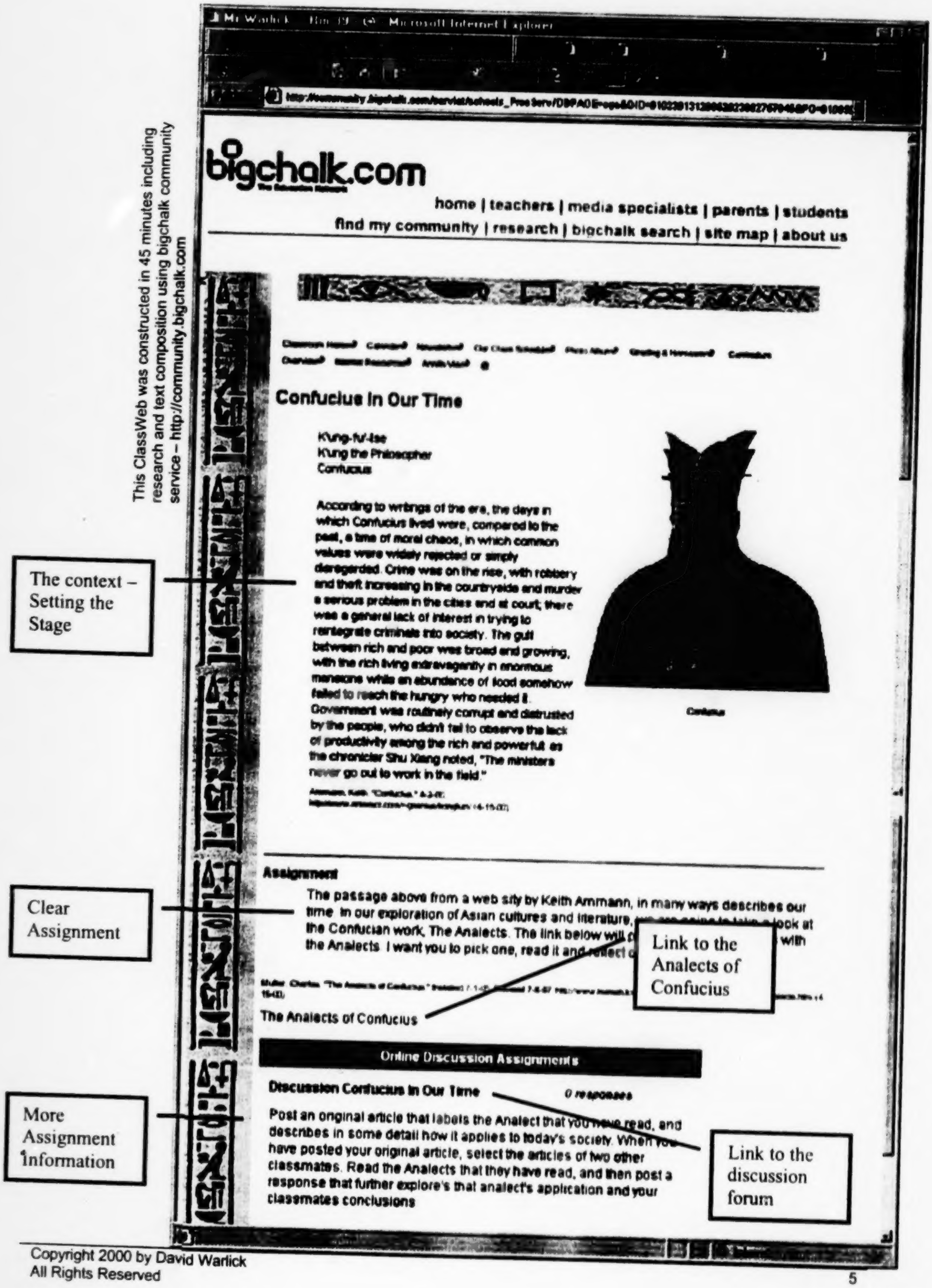
This ClassWeb was constructed in 45 minutes including research and text composition using bigchalk community service – http://community.bigchalk.com



bigchalk.com

home | teachers | media specialists | parents | students
find my community | research | bigchalk search | site map | about us

Confucius In Our Time

K'ung-fu'-tse
K'ung the Philosopher
Confucius

According to writings of the era, the days in which Confucius lived were, compared to the past, a time of moral chaos, in which common values were widely rejected or simply disregarded. Crime was on the rise, with robbery and theft increasing in the countryside and murder a serious problem in the cities and at court; there was a general lack of interest in trying to reintegrate criminals into society. The gulf between rich and poor was broad and growing, with the rich living extravagantly in enormous mansions while an abundance of food somehow failed to reach the hungry who needed it. Government was routinely corrupt and distrusted by the people, who didn't fail to observe the lack of productivity among the rich and powerful as the chronicler Shu Xiang noted, "The ministers never go out to work in the field."

Ammann, Keith. "Confucius."

Confucius

Assignment

The passage above from a web sity by Keith Ammann, in many ways describes our time. In our exploration of Asian cultures and literature, [illegible] look at the Confucian work, The Analects. The link below will [illegible] with the Analects. I want you to pick one, read it and [illegible]

The Analects of Confucius

Online Discussion Assignments

Discussion Confucius In Our Time *0 responses*

Post an original article that labels the Analect that you have read, and describes in some detail how it applies to today's society. When you have posted your original article, select the articles of two other classmates. Read the Analects that they have read, and then post a response that further explore's that analect's application and your classmates conclusions

The context – Setting the Stage

Clear Assignment

Link to the Analects of Confucius

More Assignment Information

Link to the discussion forum

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ClassWeb Techniques

Web Building

Many teachers today have learned to build web pages. New HTML editing tools are available and have been purchased by schools enabling teachers with the same tools used by professional web masters.

However, teachers are not full time web masters. They are full time teachers. Therefore, one of the foundations of ClassWebs is that they should be easy to build and can be constructed in very little time, less time than it takes to create a paper worksheet.

In the last year, a number of services have appears commonly called communities. These are web sites that enable non-professional web masters to create web pages easily and quickly, the goal being to create a place for members to come and access information. Since many of these community services also include collaborative tools, community members can also interact with each other.

These and other community services make idea tools for creating classroom web sites for students (and parents and other classroom stakeholders) and also ClassWebs as instructional tools for students.

bigchalk.com	http://www.bigchalk.com
SchoolCity	http://www.schoolcity.com
LightSpan	http://www.lightspan.com
HighWire	http://www.highwire.com

Web Links

One of the most powerful features of ClassWebs is the ability to provide for students access to a wealth of diverse information. Many of the above mentioned community tools offer the ability to create lists of links for students. However, to avail one of the most important features of ClassWebs, wrapping content with context, teachers may need to know a little HTML coding to place links to web sites in specific spots on the page. Here is how you can do this.

1. You need two pieces of information in order to create a hyperlink: a) the text (or image) that the student will click to access the web page, b) the URL or web address of the page to be accessed.

2. The link text (to be clicked) is entered into the web page along with context building materials that directs students in how they use the linked information.

3. The following HTML code is entered to the left of the link text, where the URL of the accessed page replaces *URL*

   `<a href="url">`

4. The following HTML code is entered to the right of the link text.

   `</a>`

5. The hyperlink will look like this:

   `<a href="URL">Link Text</a>`

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Web Forms

In the late summer this year, a web site and mailing list were established for the further discussion and exploration of ClassWebs. The mailing list now involves nearly three-hundred educators from 19 different countries, and discusses available Internet Tools, staff development necessary to help teachers learn to build class webs, essential skills, and examples.

The ClassWeb support site provides links to tools on the Internet that can be incorporated into ClassWebs. They include:

☐ Response-O-Matic – http://www.response-o-matic.com

A free web service that allows you to create a web fill-out form where students can answer questions or post writings and have the information e-mailed to the teacher, to a panel of experts, or to a mailing list.

☐ Server.Com – http://www.server.com

This site creates online threaded discussion forums where students can discuss with each other online issues that they might normally discuss in class. However, with the discussion forum they can reflect and craft their discussion ideas and the teacher (and students) have an archive of the entire discussion

☐ Crzy Chat – http://www.crzychat.com/

This web site produces code that can be pasted into your ClassWeb page to produce a secure chat room on your web page.

☐ Egroups – http://www.egroups.com/

This site facilitates mailing lists, chat rooms, online calendars, and many other collaborative tool.

All of these are free to teachers and there are many others on the ClassWeb support site. Also on the site are access to the mailing list archive, links to various articles and tutorials, links to example ClassWebs, and much more.

One of the goals of the ClassWeb support site and mailing list is to find ways to make the creation of ClassWebs more accessible to all teachers. One project that we are engaged in is a tool that will allow teachers to create rubrics that can be displayed on web pages. It consists of a web form that the teacher (or student) completes describing the objectives of the work and the performance indicators. After completing the form, the tool constructs a web page that displays the rubric.

The group also plans to create a similar tool that will allow a teachers to complete a form to construct an entire ClassWeb. The goal is to make ClassWebs easier for a teacher to construct than a paper work sheet.

Conclusion

ClassWebs are about solving problems. They overcome the challenges of the Internet, allow teachers to shape the technology to their specific needs, and require the least amount of technical training.

Perhaps the greatest challenge facing teachers today is the lack of time that we have to do our jobs. Creating effective learning experiences for our students takes a great deal of time, for more than teachers are paid for. Those who succeed, do it on their own time at the expense of their families and even their health. One thing that we as educators need to be doing is figuring out just what students learn better in the traditional classroom, and what they learn better at computers. It is

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possible that at some point in the future, perhaps near future, we can restructure our schools so that students spend one three or four hours in traditional classrooms under the instructional supervision of their teachers, and three or four hours a day at computers or engaged in other self-directed and less supervised learning activities – while professional teachers are planning, collaborating, designing and building, gaining skills, and inventing educational environments.

ClassWebs could be a healthy movement in that direction.

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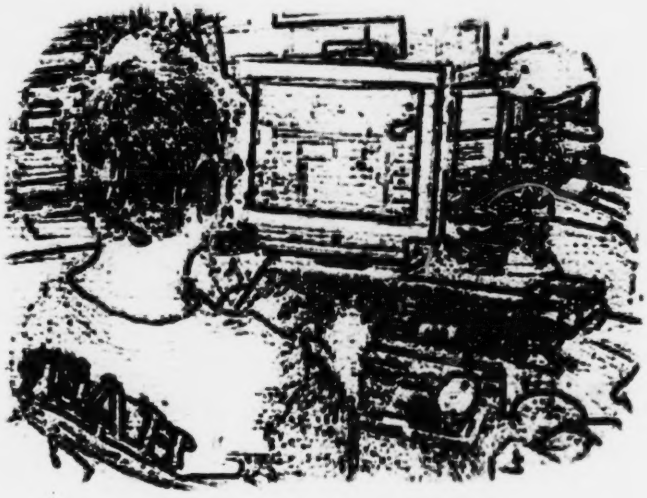
Handouts for

Finding it On the Net: Being a Digital Detective



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Finding People

Finding Experts

There are a number of services on the Internet that connect students and teachers with the appropriate expert. Here are just a few:

Service	URL
New Jersey Network Infrastructure in Education's Ask an Expert Page	http://njnie.dl.stevens-tech.edu/curriculum/aska.html
Pitsco's Ask an Expet Page	http://www.askanexpert.com/askanexpert/cat/
The Mad Scientist Network	http://medinfo.wustl.edu/~ysp/MSN/
The Franklin Institutes' Ask a Scientist Page	http://sln.fi.edu:80/tfi/publications/askexprt.html

Strategies for Locating Experts in Academia

If you are looking for an expert in a particular area of interest, such as the migration of Monarch butterflies, and you do not count an entamologist among your friends, your detective work begins. A good first place to start may be the academic community. Authority is an important advantage of finding people in this way. Their universities have hired them because they are experts.

1. We will begin with a university in Mississippi, because we know that Monarchs travel through that state. First of all, we go to Mississippi's state government home page to find a listing of universities there.

   The URLs for all state government resource pages are basically the same:

   www.state.ms.us

   …where the *ms* is the abbreviation for the state. For California, it would be

   www.state.ca.us

2. Here I find a link to Mississippi State University. From the *Mississippi State University* home page I click *Academics* and find a link to the *Department of Entomology*. Many university web pages use the term *Academics* to point toward their individual colleges and departments.

3. After I get the page for the Entomology Department, I click on *faculty* where I found experts on insect morphology, insect systematics, and insect population. Each of these faculty members has a personal home page.

4. Clicking on one of the scientists we see his picture, a list of his publications, and his e-mail address.

Finding Communities

The Internet has become a very important tool for scientists and other experts, especially for use in communicating with each other about their particular fields of study. In many cases, the Internet has become an online and extended conference, where specialists can discuss with large numbers of fellow experts the current issues about their areas of interest. One Internet tool that specialists frequently use for establishing these online discussion forums is the *Internet mailing list*. If we could join a mailing list that is used by experts in our area of interest, then we can tap into or eavesdrop on their conversations.

How do you find Internet Mailing Lists?

An excellent way to learn about mailing lists is through other mailing lists. One of the best sources for this and other types of Internet information is *Net-Happenings*, a very old mailing list that is moderated by Gleason Sackman in Fargo, North Dakota. To subscribe to this list, address an e-mail message to:

listserv@cs.wisc.edu

In the body of the message, type:

Subscribe NET-HAPPENINGS <your name>

What is an Internet Mailing List?

An Internet mailing list is very similar to the postal variety. It is a list of addresses, e-mail addresses, to which messages can be sent in a bulk-mailing fashion. Internet mailing lists have one very important advantage over postal mailing lists. **Anyone, who is on the list, can send messages to the entire list of members.** Any member of the list can send announcements, solicit help, report successes and less successful projects, and open discussions.

To join an Internet mailing list, you only need two pieces of information:

1. The name of the list, **List Name.**
2. The e-mail address of the computer that maintains the list, **List Address.**

Once you have this information, you simply address an e-mail message to the list address, and type in the subject of the message:

Subscribe <list name> <your name>

Then send the message. After a moment you will receive an automatic e-mail message from the computer welcoming you to the list and explaining some of the guidelines for participating in the discussions.

There are also a number of databases of mailing lists available on the Internet. They include.

Directory Name	URL
Tile Net	http://tile.net/
The Directory of Scholarly E-Lists	http://n2h2.com/KOVACS/
Liszt Directory of Email Discussion Groups	http://www.liszt.com/
Publicly Accessible Mailing lists	http://www.neosoft.com/internet/paml/
Search the List of Lists	http://catalog.com/vivian/interest-group-search.html

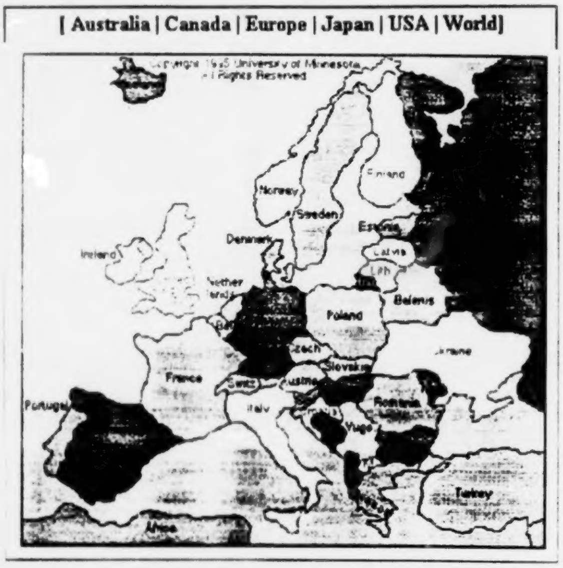
Finding Peers

Teachers can usually find peer teachers to collaborate with over education mailing lists. Much of the time you can use these same contacts to find student collaborators.

Strategies for Finding Peers on the Internet

However, if you want to locate a class in Italy with whom you want your students to correspond about the monuments of Rome, then the mailing list may not do the trick. This is easier than you might think. To find our Roman class, we can use Web66, a very old and valuable web site.

http://web66.umn.edu/


[Australia | Canada | Europe | Japan | USA | World]
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Sweden
Estonia
Latvia
Lith
Denmark
Ireland
Netherlands
Belarus
Poland
Ukraine
Czech
Slovakia
France
Switz
Austria
Italy
Romania
Yugo
Portugal
Turkey
Africa

1. From the Web66 home page we click on International Registry of Schools on the Web.
2. The Registry of Schools is a database of schools from around the world who have registered their school website so that other people can find it. There are a number of other registries, but Web66 is the oldest and biggest.
3. A map of the United States appears. We click the word **Europe** so that we can get the Europe registry page.
4. When the map of Europe appears, we click the outline of Italy and receive a list of elementary and secondary schools with websites.
5. Our science teacher will then view a number of the websites, looking for some that feature students work, an indicator that teachers are involved in the implementation of the site and not a parent or other outside agency. Send our introductory e-mail to the teachers or webmaster of the Italian site.

When searching for Italian schools through Web66, I received a list of 22 elementary and 100 secondary schools.

Finding Digital Resources

Topic Oriented Directories

Using topic-oriented directories is very much like browsing a library. You look for the shelves that hold books about the subject for which you are looking. Then you walk along those shelves looking for the book(s) on your specific topic of interest.

Topic-oriented directories organize Internet resources logically, by subject. They organize the resources in a hierarchical structure providing a list of general subjects, each subject leading to a list of topics within that subject, each topic leading to sub-topics, and usually to more subtopics. Eventually, you are presented with a list of Internet resources or websites, each related to the final subtopic that you selected.

Topic Oriented Directories

Service	URL
Yahoo	http://www.yahoo.com
Yahooligans Yahoo for children	http://www.yahooligans.com
Galaxy	http://galaxy.einet.net
NewHoo	http://www.newhoo.com
Netscape Netcenter	http://home.netscape.com
Internet Start	http://home.microsoft.com
LookSmart	http://www.snap.com
Snap	http://www.looksmart.com
Apali Spanish Languages Directory	http://www.apali.com/
Native Search Directory of Native American web resources	http://nativesearch.com

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Education Related Directories

G.R.A.D.E.S. from Classroom Connect	http://www.classroom.net/Grades
Kathy Schrock's Guide for Educators	http://www.capecod.net/schrockguide/
Planet K-12	http://planetk-12.planetsearch.com/
Blue Web'n	http://www.kn.pacbell.com/wired/bluewebn/categories.html

Search Engines

Search engines are the miracle of the Internet. These sophisticated tools seem to reach right into the global network, and scour its contents at your command. In reality, they do not work exactly in this way, although the true nature of search engines is no less fascinating.

Search Engines

Search Engine	**URL**
Alta Vista	http://www.altavista.digital.com
Excite	http://www.excite.com
HotBot	http://www.hotbot.com
Infoseek	http://www.infoseek.com
Lycos	http://www.lycos.com

Kid Friendly Search Engines *(Crawler style search engines that work to filter out adult material)*

Ask Jeeves	http://www.ajkids.com/
Disney Internet Guide (DIG)	http://www.disney.com/dig/today/
Lycos SafetyNet	http://personal.lycos.com/safetynet/safetynet.asp

Meta Search Engines *(search engines that search other search engines)*

MetaCrawler	http://www.metecrawler.com
DogPile	http://www.dogpile.com
Highway 61	http://www.highway61.com

The Language of Search Engines

Search engines are your helpers. They are information assistants who aid you in finding the information that you need to solve a problem, answer a question, or make a decision. Like any other assistant, the degree to which they are able to help depends on the degree to which you are able to tell them what you want. Therefore, communicating with your search engine is a critical part of the search process.

Search engines need to know what information you seek, and they need this information communicated in a logical way – they are, after all, computers. The language that we traditionally use to talk with computer-based searching tools is called *boolean*, named after George Boole, a mathematician of the 19th century.

In *Boolean Logic* we use **keywords** to describe what words to look for when searching the index. We also use **operators** to describe the relationships between our **keywords** and the information that we need. The basic **operators** are **AND**, **OR**, and **NOT**.

Let's use an example to explore how we would use *Boolean Logic* to search for information on the Internet. We will look for information about Native Americans in the state of Ohio. In the table below we will explore several concepts involved in speaking Boolean and relate these concepts to our search.

Concept	**Explanation/Example**	
Keyword	A keyword is a word or term that we want the search engine to consider in looking for relevant information. In our example one world that would likely appear in a web page about Native Americans is *Indian*.	
	Example:	Indian

Concept	Explanation/Example
OR	In many cases, there may be a synonym of our keyword that might appear in the web page instead of the keyword we have already chosen. So we will want to expand the number of pages that the search engine sends us to include the ones using the synonym. In the case of our example, many web pages would likely use the term *Native American*, which is more commonly used today than *Indian*. In this case we would use the operator, **OR**, to say that we want web pages with either the word *Indian* or the term *Native American*.
	Example: Indian OR Native American
AND	Since we are looking for information about Native Americans in the state of Ohio, then an additional keyword will be Ohio. We want to narrow the web pages that we get to only those about Native Americans in Ohio, so we will say that both terms must be present. Here is where we will use AND.
	Example: Indian OR Native American AND Ohio
NOT	As we think through the information that we are likely to receive, we realize that there is a baseball team in Cleveland, Ohio called the Indians. We will want to filter out all web pages about the baseball team. So we will add a new keyword, *baseball*, and connected it to our search express with the operator, **Not**. We are saying that the acceptable web page should NOT have the keyword *baseball* in it.
	Example: Indian OR Native American AND Ohio NOT baseball
quotes	Just as we use commas, question marks, and other punctuation to help communicate with people, we use special symbols to clarify what we want from a search engine. One example is the use of quotation marks to define phrases. In our example, Native American is going to look like two separate words to the search engine that could each appear any place in the web page. To communicate that these two words belong together as a distinct phrase, we use quotes.
	Example: Indian OR "Native American" AND Ohio NOT baseball
Parentheses	Each **operator** in a search expression defines a distinct *keyword concept*. Keyword 1 AND Keyword 2 Keyword 3 OR Keyword 4 Keyword 5 NOT Keyword 6 A keyword concept can consist of: A single keyword or phrase Two single keywords or phrases connected by an operator Keyword concepts connected by an operator to other keyword concepts or single keywords or phrases. Individual keyword concepts are marked by enclosing them in parentheses. In our example, the following are distinct keyword concepts: Indian (Indian OR "Native American") ((Indian OR "Native American") AND Ohio) The final keyword concept, the one that includes all constituent keyword concepts is called our search expression.
	Example: ((Indian OR "Native American") AND Ohio) NOT baseball

Admittedly, Boolean Logic is not the simplest thing to understand or teach. However, it is a very effective way of communicating with search engines your information needs.

To make things easier for casual users, Internet search engines have developed alternatives to traditional Boolean Logic. One of the most common conventions is the use of pluses (+) and minuses (-), to indicate which terms must (+) and must not (-) be present in the returned documents. Each search engine has developed its own version of these searching conventions, each trying to improve upon these standards, and this evolution of the search language continues. None is perfect and you will find that finding information from the Internet is more a process than the click of a button.

	An Alternative Search Convention
Pluses (+)	Any keywords in your search expression that MUST appear in your target web page should be preceded by a plus symbol (+). If the keyword is a phrase, then it should be enclosed by quotes
	Example: +basketball +"Mike Jordan"

Minuses (-)	**Any keyword that must NOT appear in your target web page should be preceded by a minus symbol (-). As when using the plus symbol, if the keyword is a phrase, then it should be enclosed by quotes.** Example: +basketball +"Mike Jordan" -Nike
Pipe (|) This character is usually above the backslash (\\)	The pipe character helps you to fine tune your search. Place and pipe character between to search terms tells the search engine to search for the first term and then search for the second term within the first term's hits. Example: Internet|Web

Net-Smarts

Net-smarts is perhaps your most valuable tool in finding information on the Internet. It is a growing awareness of what is available on the Internet and how it works, and a growing sense of "where is the best first place to start?" As mentioned earlier, searching the Internet involves investigating an information environment, turning over stones, checking for fingerprints, examining strands of hair. It means having an idea of what you are looking for, and at the same time being open for the unexpected.

More than anything, being net-smart involves asking questions. Here are some questions that must be asked and considered when embarking on an information safari on the Internet.

1. What do you want to find?
2. Will the information most likely be found in articles, company web pages, software, conferences, discussion groups, or people. The answer to this question helps you decide on a search strategy.
3. Why would someone publish this information on the Internet?
4. Who would publish this information on the Internet?
5. Who would host this information on the Internet?
6. What would a web page with the Information I seek look like?

Questions two through five would each help us in developing our search phrase.

7. Are you wanting to broaden your knowledge of a general topic or do you want more narrow, specific information?

Broad or general information is usually best found in topic-oriented directories. More information on more specific topics is best found with search engines.

The S.E.A.R.C.H. Process

Conducting effective searches of the Internet is rarely a matter of typing in a single keyword and being presented with the solution to your problem. It is much more frequently a series of searches, each revealing more clues about the information that is available, and where that information can be found.

Developing a search process can be difficult, because each person's process depends on their personal style of using information and the particular types of information that they typically need. However, there is a process that can be used as a springboard to the personal procedures that you develop with experience. The process is called S.E.A.R.C.H. It is an acronym for the process that has you **Start** with a small database search tool, **Edit** your search expression, **Advance** to a larger database search tool, **Refine** your search phrase, **Cycle** back and advance again, and finally, **Harvest** your information gems.

On the next page is a larger representation of the S.E.A.R.C.H. process

From *Raw Materials for the Mind* by David Warlick
ISBN 0-9667432-0-2 – http://landmark-project.com/rmfm

Search Strategy

Notes:

Search with a key term on Yahoo or another small index search tool.

You start with a small index search tool for two reasons:

1. You will receive a limited and manageable number of hits.
2. The hits that you get will be representative of what is available on the subject

Examine the hit pages collecting words that are common among the relevant hits and words that are common among the irrelevant hits.

Edit the search expression with terms gleaned from the initial search.

Add words collected from the initial search, including words common among relevant and irrelevant pages. Construct a boolean search expression that effectively communicates the information that you seek.

Advance into more advances and extensive search engines

Enter the edited search phrase into a larger index search tool. Examples are:

Excite	http://www.excite.com
InfoSeek	http://www.infoseek.com
Alta Vista	http://www.altavista.digital.com
HotBot	http://www.hotbot.com

Refine the search expression

Explore the pages reported by the larger search engine and refine the expression even more, further defining the relevant hits, and filtering the irrelevant. Again, examine both good hits and bad hits.

Cycle back and Advance again.

Return to the advanced search engine that you used before or use another search engine.

Harvest the results

Collect the needed information by printing, downloading, forwarding by e-mail or just reading.

Web Pages Worth Bookmarking

Educational Web Directories

Service	Description
Landmarks for Schools	This website is dedicated to providing teachers with links to information raw materials with which they can create learning resources and their students can construct information products. http://www.landmark-project.com/
Kathy Schrock's Guide for Educators	This is a rich and regularly updated list of links organized specifically for teachers. http://school.discovery.com/schrockguide/sos.html
Education World	This is a long-standing and content rich site that whose history include the old *Weekly Reader*. The site includes lists of links organized by subject area. This site also includes articles written for and by teachers. http://www.education-world.com
Blue Web'n	Another old resource with lots of annotated sites organized by content or by subject. The site also includes a very powerful search tool for finding sites at the subject area and grade level for you. A real time saver for busy teachers. http://www.kn.pacbell.com/wired/bluewebn/
Global SchoolNet Foundation	Recently purchased by Lightspan, Inc., the people at GSN probably know more about online instructional projects than anyone else. Their projects are among the best in the world, and their *Projects Registry* tool allow teachers from all over to develop and publish their project ideas for collaborators. http://www.gsn.org
ThinkQuest	ThinkQuest is not just a project for students to create web pages, but it is also a library of more than a thousand web sites created explicitly to help people learn. http://www.thinkquest.org/

Commercial & Public Sites

Service	Description & URL
PBS Online	This website offers a wide variety of resources for teachers to be used in conjunction with PBS programming. http://www.pbs.org/
Discovery Channel Online	Like PBS, this website offers materials and other opportunities to be used with their programming. http://www.discovery.com/
The History Channel	This site has a wealth of material. One of the most interesting resources is *Great Speeches*, an archive of recordings (Real Audio files) of great speeches of our century. The include Mahatma Gandhi, Jimmy Hoffa., LBJ, George Bernard Shaw, and Babe Ruth. http://www.historychannel.com
CNN Interactive	This rich website hold a large number of resources for teachers of just about any discipline. On valuable resource is the *Transcripts* service which stores the text transcripts for CNN programming over the past week or so. http://cnn.com/TRANSCRIPTS/
	Video Archive is another useful service. It is a searchable database of video files (QuickTime). A search of *biotechnology* returned 76 clips. http://cnn.com/video_vault/
	CNN offers another service that could be useful for teachers. Called *Custom News*, teachers can indicate the specific issues that they are interested in based on current and upcoming units of study, and CNN will build a custom page with links to current stories on those issues.

Educational Web Directories Service	**Description**
	[redacted] http://cnn.com/CustomNews/
Earth Science Enterprise from NASA	This rich resources provides links to a wide variety of web sites falling under each of the following categories: air, water, land, life, sun. http://www.hq.nasa.gov/office/ese/science/
	Earth Science Enterprise also has an archive if images that can be used in learning materials. http://www.hq.nasa.gov/office/ese/gallery/

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Technomaniacs

Susan LaValley and Michelle Webb-Upham

A Short (Always Under Construction) List Of Recommended Software for K-3

Reading and Language Arts

Title	Publisher	Age Level
A to Zap	Sunburst	3-7
Arthur's Reading Race	Broderbund	4-7
Arthur's Teacher Trouble	Broderbund	6-10
The Amazing Writing Maching	Broderbund	5-10
The Cat in the Hat	Broderbund	3-7
Carmen San Diego Word Detective	Broderbund	7-12
Dr. Seuss's ABC	Broderbund	3-7
Easy Book	Sunburst	5-12
Green Eggs and Ham	Broderbund	4-7
Hyperstudio	Roger Wagner Publishing	6-adult
Imagination Espress Series	Edmark	5-13
Just Grandma and Me	Broderbund	3-7
Kid Pix Deluxe	Broderbund	4-10
Kid Works Deluxe	Davidson	4-8
Let's Go Read-Island	Edmark	4-6
Let's Go Read-Ocean	Edmark	6-8
Millie and Bailey's Schoolhouse Kindergarten	Edmark	4-7
My Personal Tutor	Microsoft **Windows only	3-6
Orly's Draw-a-Story	Broderbund	5-10
Ready to Read With Pooh	Disney Interactive	3-6
Stanley's Sticker Stories	Edmark	4-8
Thinking Things I, II	Edmark	4-8, 6-12

Math

Title	Publisher	Age Level
The Graph Club	Tom Snyder	5-12
Logical Journey of the Zoombinis	Broderbund	6-12
My Personal Tutor	Microsoft__ *Windows only	3-6
Preschool Apple Bundle Patterns/Geometry, Blocks Bugs in a Box, etc	Apple	4-7
Ready for Math With Pooh	Disney Interactive	4-7
Trudy's Time and Place House	Edmark	4-7
Wild West Math	Micrograms	7-10

Science and Social Studies

Title	Publisher	Age Level
Sammy's Science House	Edmark	4-7
Claris Works for Kids		4-10
Imagine Express Series	Edmark	7-Adult
Magic School Bus	Microsoft	6-10
Neighborhood Map Machine	Tom Snyder	5-12

Literature Links

Rosie's Walk - Pat Hutchins
Arthur Writes a Story-Marc Brown
Ten Black Dots - Donald Crew
I Can Write - Theo LeSieg
Chicka Chicka Boom Boom-Bill Martin Jr.
I See Patterns
Bugs In A Box - David A. Carter
Annos Counting Book - Mitsumasa Anno

Software Resources

Edmark 1-800-362-2890 www.edmark.com
Apple www.apple.com
Tom Snyder 1-800-342-0236 www.teachtsp.com
Broderbund 1-800-474-8840 www.broderbund.com/education
Davidson/Knowledge Adventure 1-800-545-7677 www.davd.com
Disney 1-800-900-9234

Notes

Let's Go Read

Kid Works

Millie's Math House

Kid Pix

Neighborhood Map Machine

Claris Works for Kids

Internet Project Based Learning for the Classroom Teacher
NECC 2000

By Jean Weller and Kate Santhuff

- Introduction
- Projects: What Are They?
- Types of Projects (Powerpoint)
    - Judi Harris' Virtual
    - Architecture
    - WebQuests
- Guided Browsing
    - Hyperlinks
    - Checklist
- Share Your Treasures!
- Implementing Projects in the Classroom
- Creating Your Own Projects
    - Judi Harris' Guidelines
    - WebQuests
    - Filamentality
- Questions?

Contact us!

Jean: jweller@montwell.com

Kate: kate@3rdWaveWeb.com

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Evaluation Checklist for Internet Projects

Academic Goals:

Process-Oriented Goals:

Project Name:
Site URL:
Grade Level(s):
Curriculum Tie-in:
Time Frame:

➤ **How often are we required to be online?**
__One Time Only __Everyday __Every few days __Every week __Every two weeks __Sporadic

➤ **What level of support for linking our class with other classes is built in to the project?**
__Link to others is part of project __No link to others; need to recruit our own partners
__Not necessary for this project

➤ **Do we know how to use all of the technology required?**
__Yes __Most __Some __None

➤ **Do we have good support for the technology needed?**
__Yes __No

➤ **How much extra preparation of the students needs to be done before we start (either academics or skills)?**
__We've already done it __1 or 2 lessons __A week __More than a week

➤ **What types of activities will students do?**
__Whole group work __Small group work __Individual work
__Computer intensive __Web intensive

Comments and Impressions:

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Resources Checklist

(Adapted from NickNacks, http://home.talkcity.com/AcademyDr/nicknacks/)

The Basics

Computer/Model	
RAM size (mb/gig)	
Hard Drive Size (mb/gig)	
Processor Speed (mhz)	
Internet Connection	Modem/Dial-up | School Network Server
E-mail Software	
Compression Software	
A/V Ready?	

Software (List titles and versions)

TEXT: Word Processing	
GRAPHICS:	
Draw/Paint Software	
Imaging Software	
Digital Camera and Software	
Graphing/Works Software	
Scanner and Software	
SPREADSHEETS: Software	
SPECIAL:	
Free Players (i.e., Acrobat)	
Page Layout/Desktop Publishing	
Presentation Software	
Movie/Animation Software	
SOUNDS:	
Digital Microphone	(Internal: YES NO)

Music Player Software	
Multimedia Player (i.e., Quicktime)	
Live Web Player	
WWW:	
HTML Editor	
URL for Posting	
FTP Server (directory)	
FTP Software	
CONFERENCING:	
Video Camera	
Digitizer Software	
IRC Software	
Video Software	
Other:	
CROSS-PLATFORM:	
MacLink Plus/PC Exchange	
JPEG/GIF Conversion Software	
Sound Conversion Software	

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Creating Virtual Tours
With
QuickTime Virtual Reality

NECC 2000
Atlanta, Georgia

QuickTime VR
Authoring Studio™

Agenda

1:30 - 2:00

- Introduction
- Statement of objective
- Overview of suggested requirements
- Equipment needs and options

2:00 - 2:45

- Practice gathering pictures
- Compiling VR Panoramas

2:45 - 3:30

- Practice gathering pictures
- Compiling VR Objects

3:30 - 4:00

- Creating VR Scenes

4:00 - 4:30

- Follow Up Questions
- Contact Information

System Requirements

Minimum system configuration

- Mac OS-based computer with a Power PC processor
- 16 MB RAM available for the QuickTime VR Authoring application program
- 40 MB of space available on your hard disk
- CD-ROM drive

System requirements for playing QTVR media

Mac OS

- QuickTime extension version 2.5 or later
- QuickTime VR extension version 2.0.1 or later
- MoviePlayer version 2.5 or SimpleText

Windows

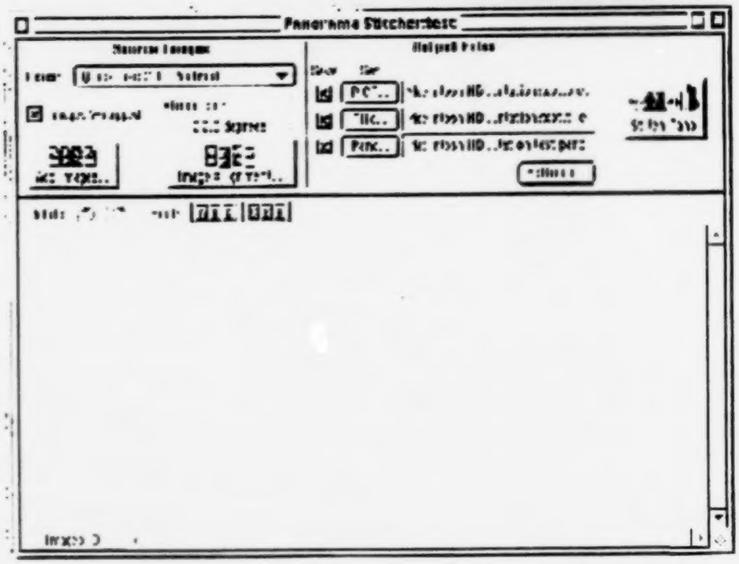
- 486 or Pentium processor
- QuickTime for Windows version 3.0 or later
- QuickTime VR components version 2.1 or later
- MoviePlayer version 3.0 or later

Over the Internet

- If you are playing QTVR media over the internet, you need a World Wide Web browser with the QuickTime plug-in version 2.0 or later installed

Panorama Stitcher

- Open software
- Select New from the File menu, then select Panorama Stitcher
- Type a name for your Panorama Stitcher document
- Select Save



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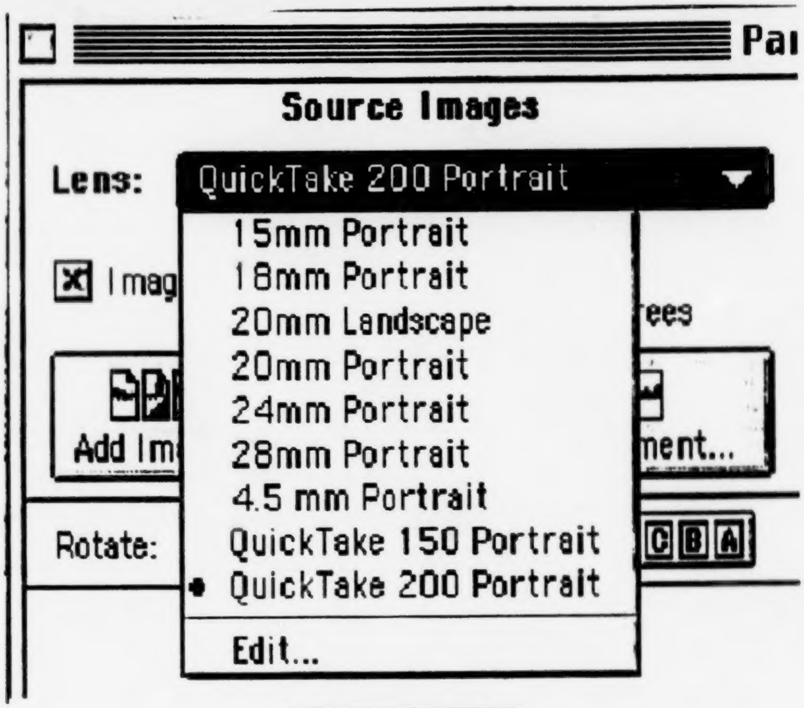
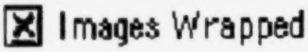
- Select your lens in the Lens pop-up menu


Pa
Source Images
Lens:
QuickTake 200 Portrait
15mm Portrait
18mm Portrait
20mm Landscape
20mm Portrait
24mm Portrait
28mm Portrait
4.5 mm Portrait
QuickTake 150 Portrait
● QuickTake 200 Portrait
Edit...
☒ Imag
ees
Add Im
ment...
Rotate:
C B A

- Click Add Images
- Select the images you want to use (PICT, TIFF, JPEG, GIF)

- Click to select the wrap images box (360 degrees)


☒ Images Wrapped

- Click Image Alignment

Image Alignment...

- Enter appropriate angle (16 pictures = 22.5 degrees) and Click OK

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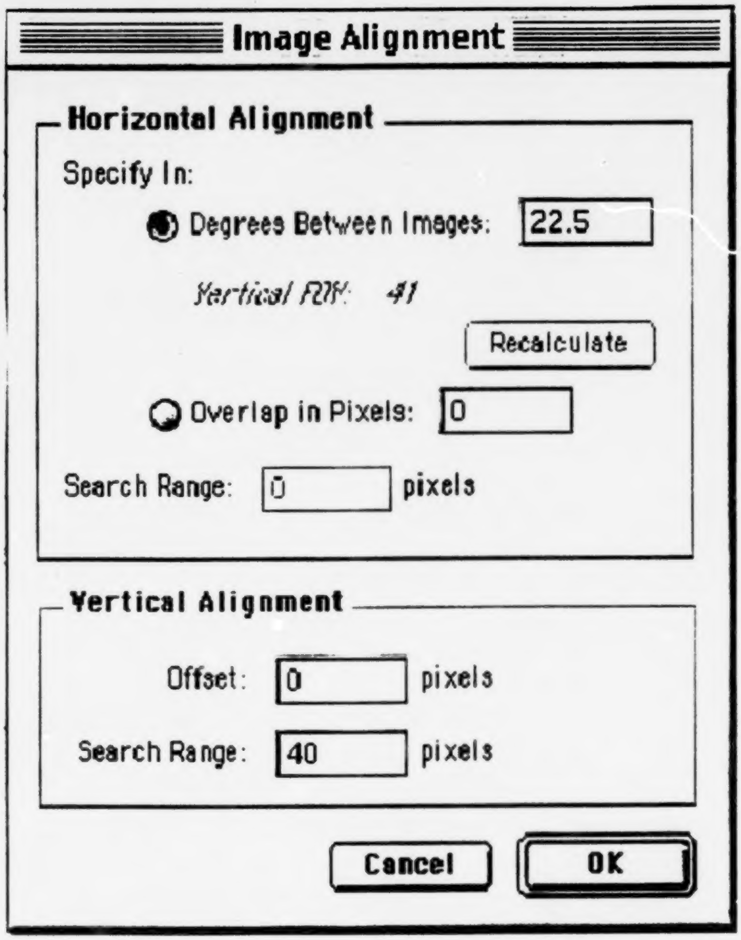


Image Alignment

Horizontal Alignment

Specify In:

● Degrees Between Images: 22.5

Vertical FOV: 41

○ Overlap in Pixels: 0

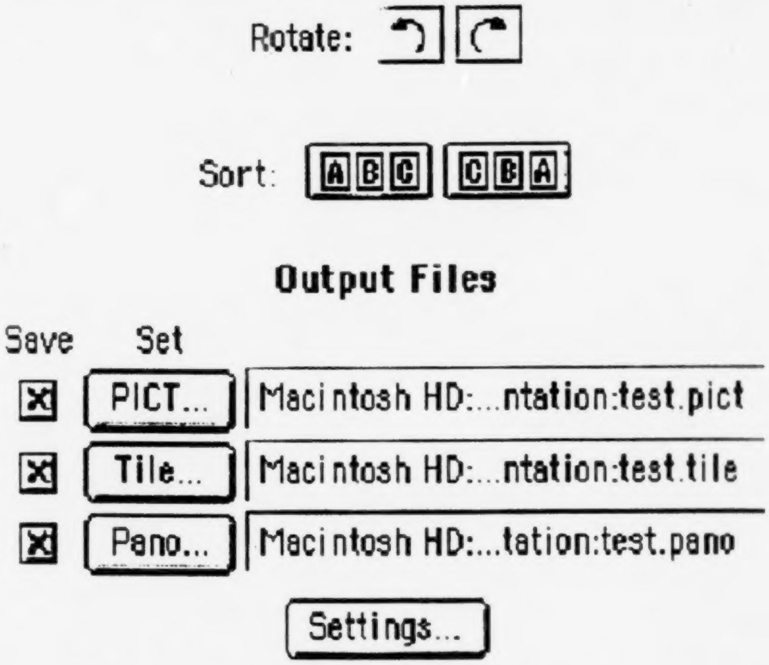
Search Range: 0 pixels

Vertical Alignment

Offset: 0 pixels

Search Range: 40 pixels

- Click the appropriate arrow to rotate your pictures
- Click the appropriate Sort button to change the order of your images
- Check or UN-Check which files you want to save/not save (PICT, Tile, Pano)
- Change the name and/or location of your file/s
- Click settings



Output Files

Save	Set	
☒	PICT...	Macintosh HD:...ntation:test.pict
☒	Tile...	Macintosh HD:...ntation:test.tile
☒	Pano...	Macintosh HD:...tation:test.pano

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- Click Image tab: Blend, Fill, Deskew, Sharpen, Stretch, Crop, Auto Size
- Click Compression tab: Auto, Settings
- Click Playback tab: View Size, Pan Range, Default Tilt, Tilt Range, Default Zoom
- Click Imaging tab: Static Quality and Correction, Motion Quality and Correction
- Click File tab: Flattening, Copyright
- Click OK

- Click Stitch Pano

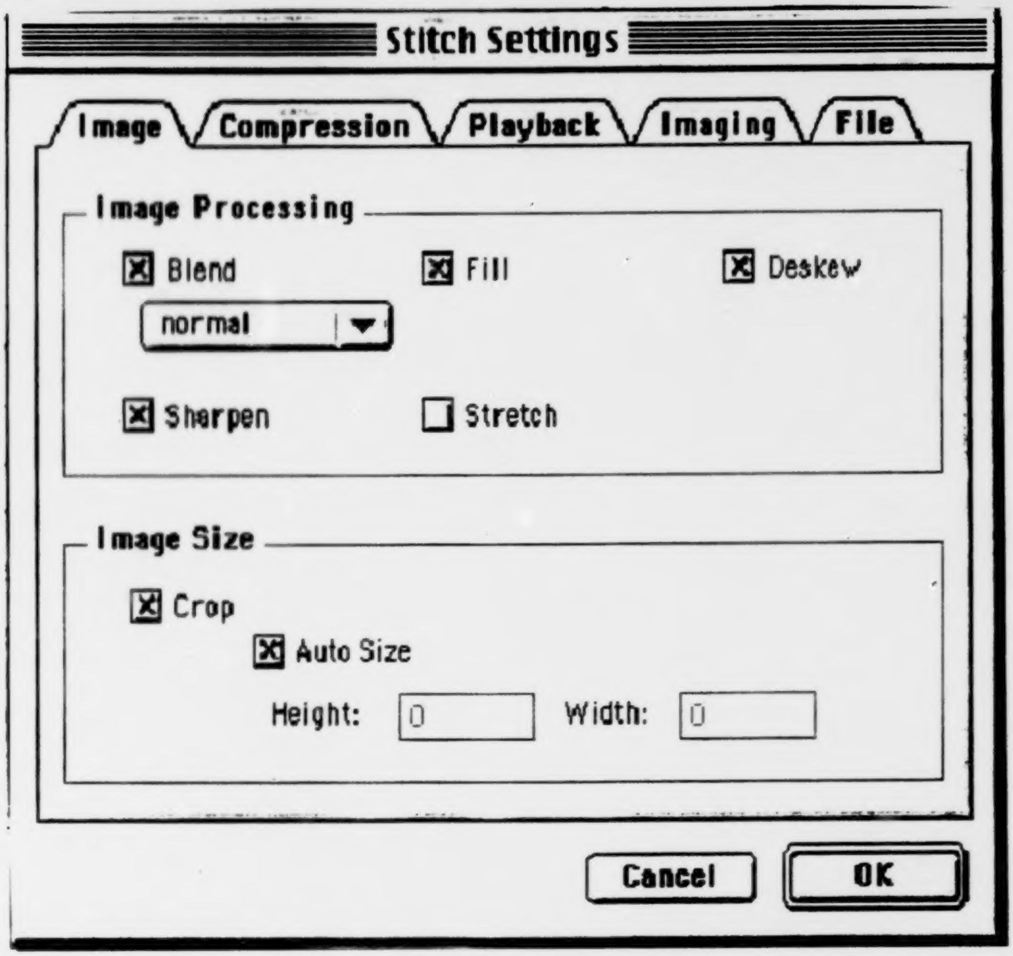
Stitch Settings
Image
Compression
Playback
Imaging
File
Cancel
OK

Image Processing

☒ Blend normal
☒ Fill
☒ Deskew
☒ Sharpen
☐ Stretch

Image Size

☒ Crop
☒ Auto Size
Height: 0
Width: 0

Object Maker

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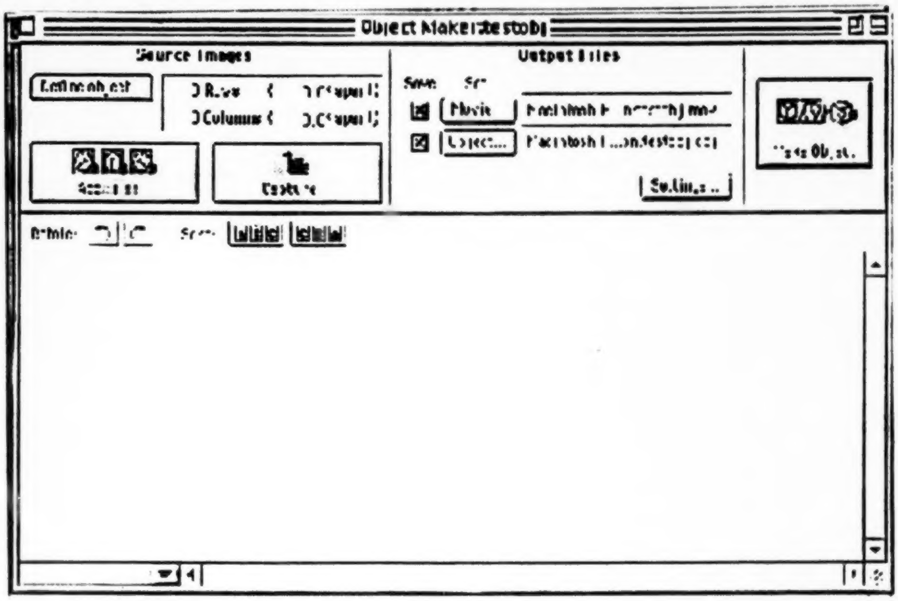
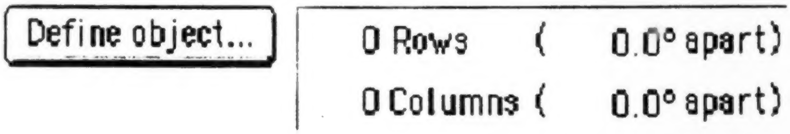
- Open software
- Select New from the File menu, then select Object Maker
- Type a name for your Object Maker document
- Select Save
- Object Maker window appears

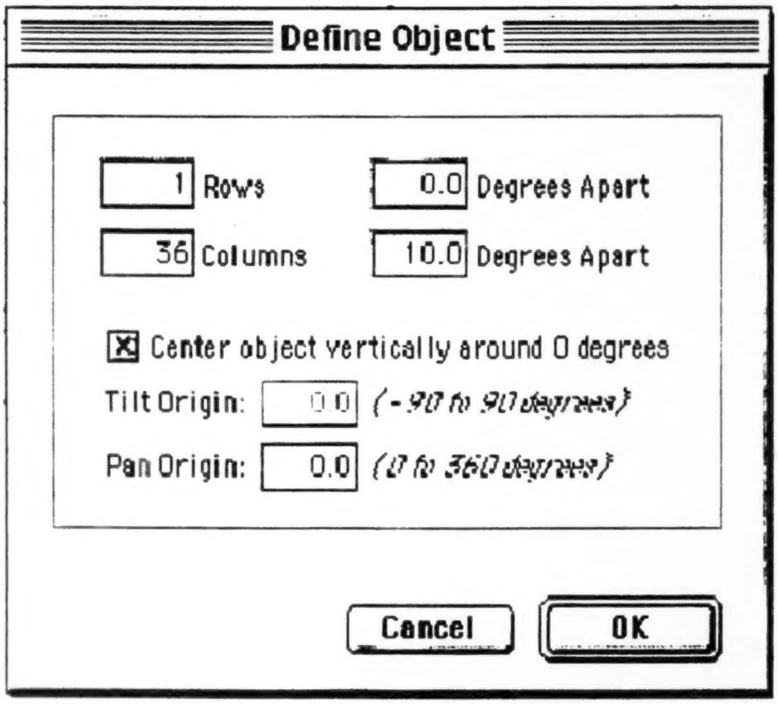

Source Images
Output Files

- Click Define Object


Define object...

0 Rows (0.0° apart)
0 Columns (0.0° apart)

- Enter the number of rows and columns


Define Object
Cancel
OK

1 Rows — 0.0 Degrees Apart
36 Columns — 10.0 Degrees Apart
☒ Center object vertically around 0 degrees
Tilt Origin: 0.0 (-90 to 90 degrees)
Pan Origin: 0.0 (0 to 360 degrees)

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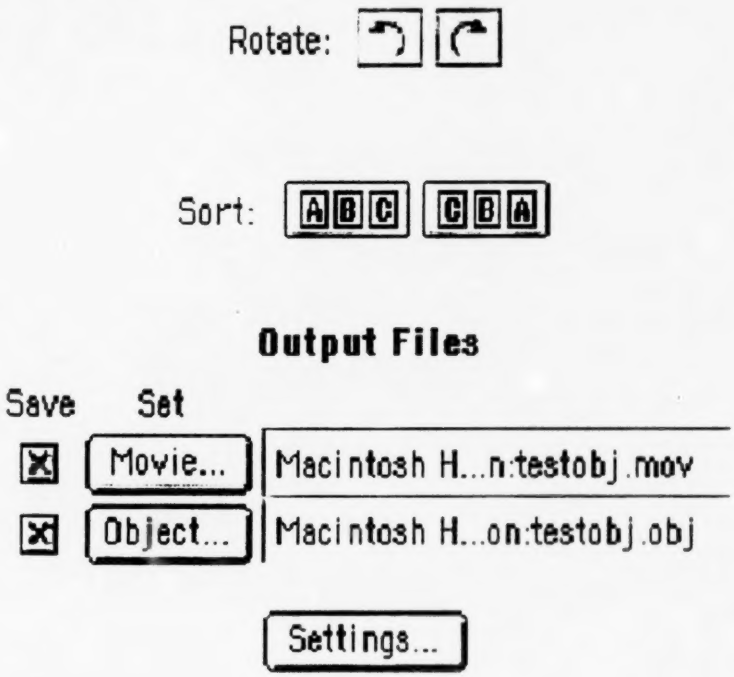
- Click Add Files
- Select the images you want to use (PICT, TIFF, JPEG, GIF)

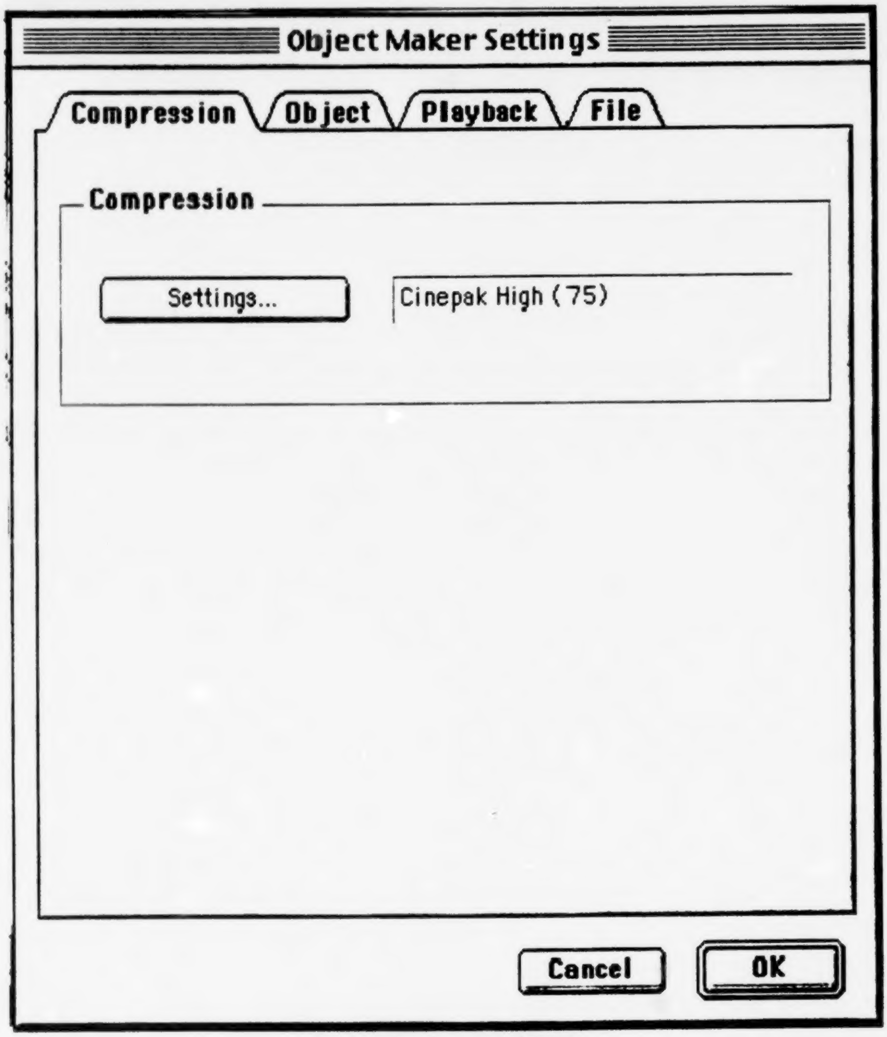
- Click the appropriate arrow to rotate your pictures
- Click the appropriate Sort button to change the order of your images
- Check or UN-Check which files you want to save/not save (Movie, Object)
- Change the name and/or location of your file/s
- Click settings
- Click Compression tab: Settings
- Click Object tab: Horizontal & Vertical Controls, Animate View Frames, Auto-play Views, Scale~~able,~~ Mouse Scale Factor
- Click Playback tab: User frame Size, Default Pan, Default Tilt, Default Zoom, Default View State, and Mouse Down View State
- Click File tab: Flattening, Preload, Copyright
- Click OK



☒ Movie... Macintosh H...n:testobj.mov

☒ Object... Macintosh H...on:testobj.obj

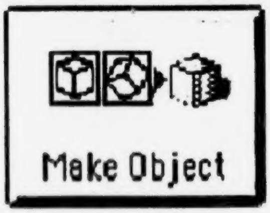
BEST COPY AVAILABLE


Object Maker Settings
Compression
Object
Playback
File
Settings...
Cancel
OK

Compression

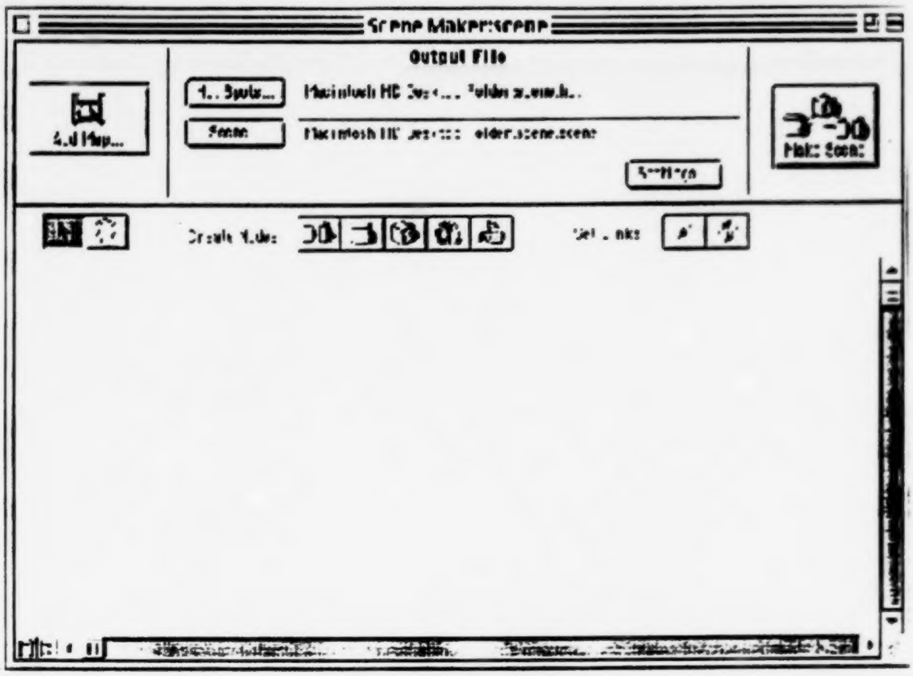
Cinepak High (75)

- Click Make Object


Make Object

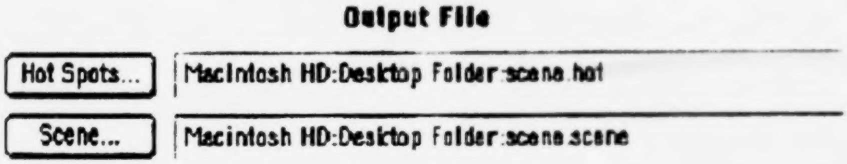
Scene Maker

- Open software
- Select New from the File menu, then select Scene Maker
- Type a name for your Scene Maker document
- Select Save
- Scene Maker window appears


Scene Maker:scene
Output File
Add Map...
Make Scene

- Click Add Map (optional)
- Select a map file for your scene

- Click to change the name and/or location of your file/s (Hot Spots, Scene)

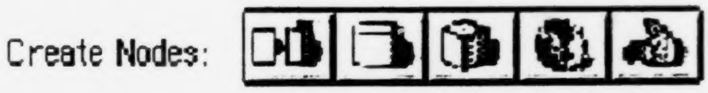


Output File

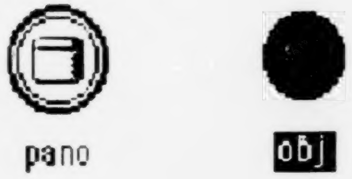
Hot Spots... Macintosh HD:Desktop Folder:scene.hot

Scene... Macintosh HD:Desktop Folder:scene.scene

- Scene Components: Panorama Stitcher; Panorama Maker; Object Maker; URL; Blob


Create Nodes:

- Click and drag to the Scene Maker window all Panoramas and Objects



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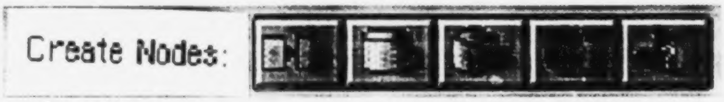
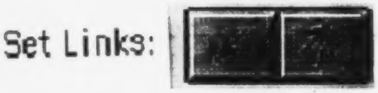
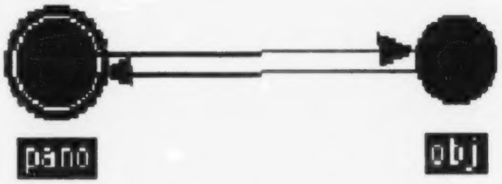
- For URL and Blobs, Click the appropriate icon
- Move the cursor to the Scene window and click
- An icon representing the URL of Blob appears
- The node's name, Untitled, appears just below it



- Click the Set Dual Links button or One-way Links button
- The Dual Link icon allows you to go back and forth between Panoramas and Objects
- You cannot create a Dual Link to an URL or a Blob

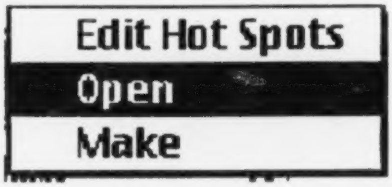


- After selecting the Link, place pointer over a node and drag the pointer to another node



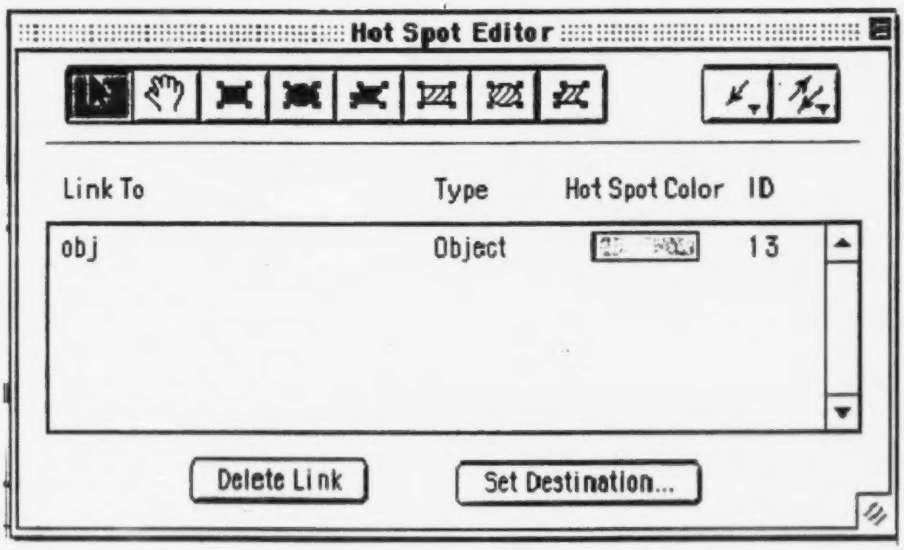
- Click the Arrow icon to select a node
- (The Hand icon allows you to move the map)

- Place the pointer over the linked panorama node, then press and hold
- A pop-up menu appears
- (Edit Hot Spot - Opens the Hot Spot Editor window)
- (Open - Opens the panorama or object)
- (Make - Processes the node)


Edit Hot Spots
Open
Make

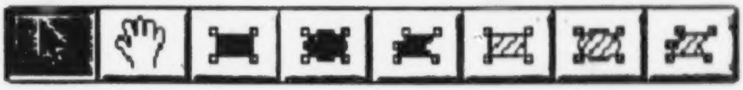
- Choose Edit Hot Spot

- The Hot Spot Editor window appears

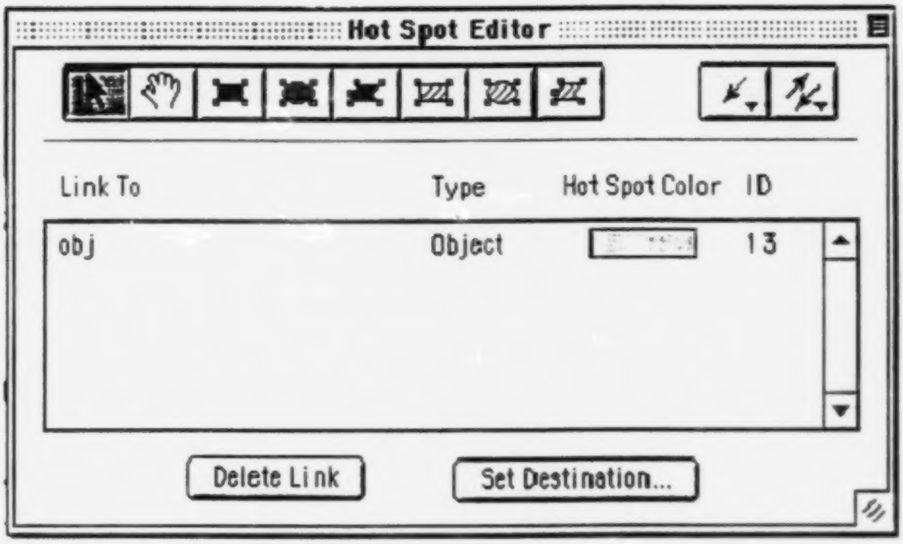

Hot Spot Editor
Delete Link
Set Destination...

Link To	Type	Hot Spot Color	ID
obj	Object	▨	13

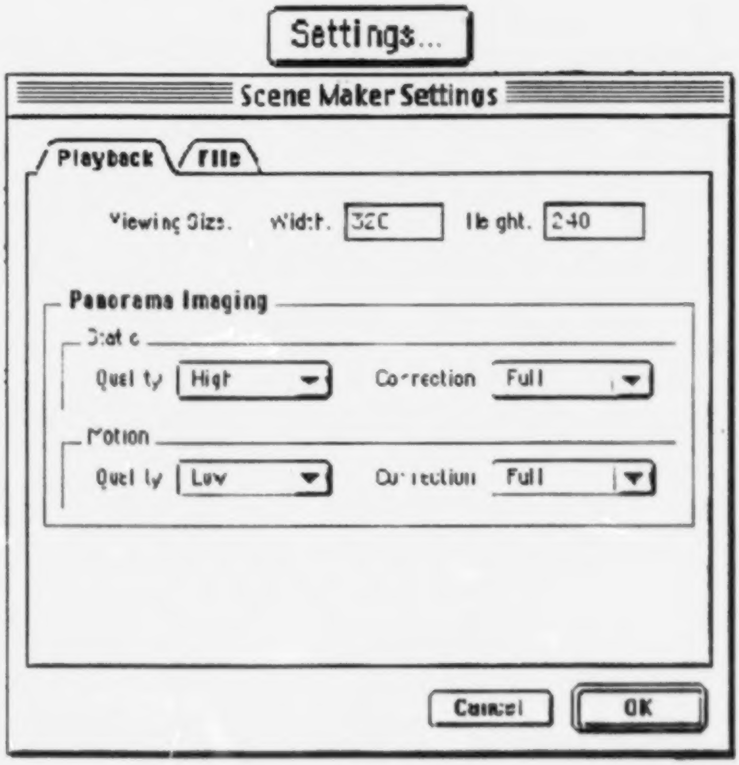
- Define the hot spot by selecting one of the geometric shapes in the Hot Spot Editor window
- Click and drag the pointer over the area that you want to define as a hot spot



- Click the Set Destination in the Hot Spot Editor window which will display an image of the destination mode
- Select the view that fits well with the view from which the viewer will be linked
- Chose Set Destination
- Close the Set Destination window
- Click Save
- Repeat as necessary
- Click Settings: Playback; File


Hot Spot Editor
Delete Link
Set Destination...

Link To	Type	Hot Spot Color	ID
obj	Object		13


Settings...
Scene Maker Settings
Playback
File
Panorama Imaging
Cancel
OK

Viewing Size. Width: 320 Height: 240

Static
Quality: High Correction: Full

Motion
Quality: Low Correction: Full

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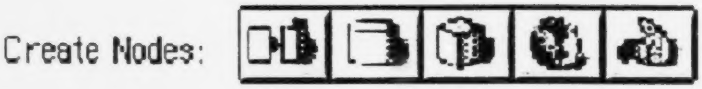
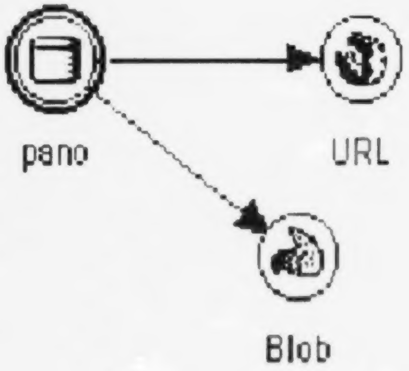
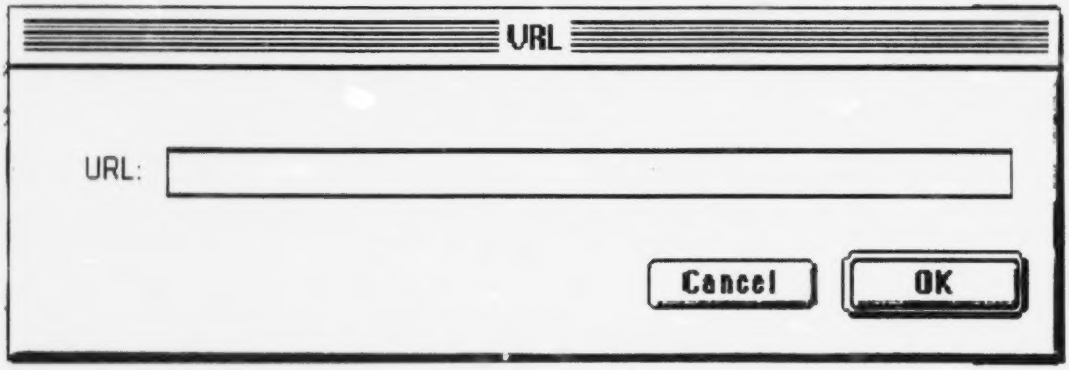
- Click the Blob or URL button
- in the Scene Maker window
- Create a one-way link from a panorama or object
- Place the pointer over the node and select Edit Hot Spots
- Follow the steps described earlier
- Click and hold down on the URL icon
- Select Open

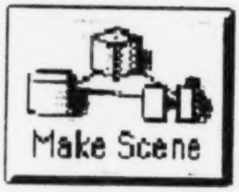




- Type the complete URL in the window that appears
- Click OK
- Blobs are used with a programming tool or scripting language to define what action is taken when the user clicks the Blob link



- Click the Make Scene button in the Scene Maker window
- When finished, a playback window opens
- Check links and make adjustment as needed



Click to open author's original document.

Creating Virtual Tours
With
QuickTime Virtual Reality

LIST OF RESOURCES

- QuickTime VR Authoring Studio
    - Apple Computer, Inc
- The QuickTime VR Book
    - Susan A. Kitchens
    - Peachpit Press
    - ISBN: 0-201-69684-3
- www.kaidan.com
- www.vrtoolbox.com
- www.apple.com
- www.smgVR.com
    - mapsaVR
    - soundsaVR
- www.adessosoft.com

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CONNECTING @ THE CROSSROADS

Developing multimedia tools to support functional and community training

Dr. Cheryl Wissick, University of SC, Columbia, SC
Dr. John Langone, University of Georgia, Athens, GA
Charles de Krafft, Richland District Two, E.L. Wright 8th Grade Algebra Teacher
Windy Schweder, Doctora
Poster Session: June 26, 2000

I. **Why Multimedia?**
II. **Examples of Multimedia**
  - **Web-based**
  - **PowerPoint**
  - **HyperStudio**
III. **How to create Multimedia**
IV. **Works in Progress**

Web References:
World Wide Web Toolboxes
http://www.ed.sc.edu/caw/toolbox.html
Buying Lunch at the Cafeteria
http://www.ed.sc.edu/caw/cafe/cafeteria photo/cafe1.htm
Grocery Shopping Links
http://www.ed.sc.edu/caw/toolboxshop.html

References:

Alcantara, P. R. (1994). Effects of videotape instructional package on purchasing skills of children with autism. Exceptional Children, 61, 40-55.

Cuvo, J., & Klatt, K. (1992). Effects of community-based, videotape, and flashcard instruction of community referenced sight words on students with mental retardation. Journal of Applied Behavior Analysis, 25, 499-512.

Haring, T. G., Breen, C. G., Weiner, J., Kennedy, C. H., & Bednersh, F. (1995). Using videotape modeling to facilitate generalized purchasing skills. Journal of Behavioral Education, 5, 29-53.

Haring, T. G., Kennedy, C. H., Adams, M. J., & Pitts-Conway, V. (1987). Teaching generalization of purchasing skills across community settings to autistic youth using videotape modeling. Journal of Applied Behavior Analysis, 20, 89-96.

Langone, J., Shade, J., Clees, T., and Day, T. (In press). Effects of multimedia instruction on teaching functional discrimination skills to students with moderate/severe intellectual disabilities. International Journal of Disability, Development and Education, 46(4).

Roblyer, M. D. & Cass, M. (1999), Still more potential than performance: Virtual reality research in special education. Learning and Leading with Technology, 26(8), 50-53.

Wissick, C.A., Lloyd, J.W., & Kinzie, M.B. (1992). The effects of community training using a videodisc-based simulation. Journal of Special Education Technology, 11, 207-22.

Wissick, C.A., Gardner, J. E., & Langone, J. (1999). Video-based simulations: Considerations for teaching students with developmental disabilities. Career Development for Exceptional Individuals, 22, 233-249.

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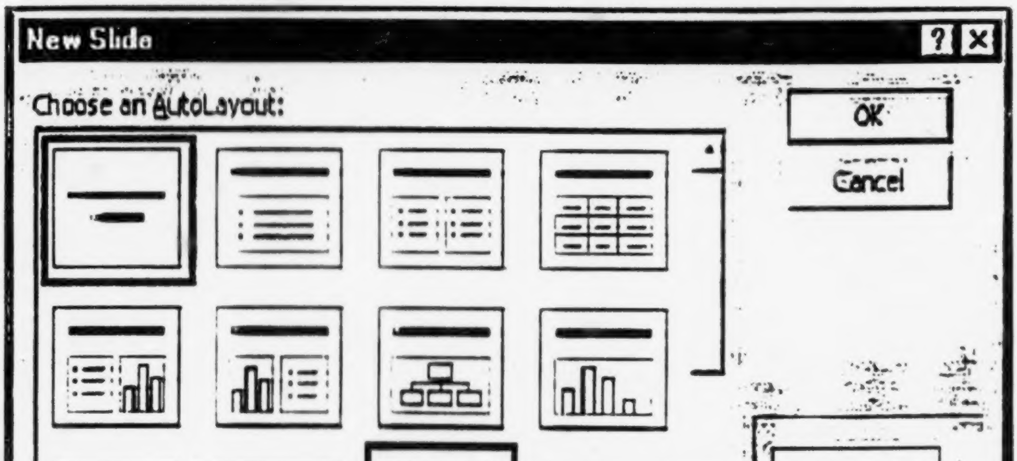
"How-To" Page

Creating Concept Slides with PowerPoint

Creating slides with one photo per page:

Introducing concepts with one slide and one word,
Teaching students with examples and not-examples

1. Start PowerPoint and choose Blank Presentation.
2. Insert new slide
3. Choose "title only" Autolayout



4. Insert - Picture - From File (EX: open clipart used instead of photo to save space)

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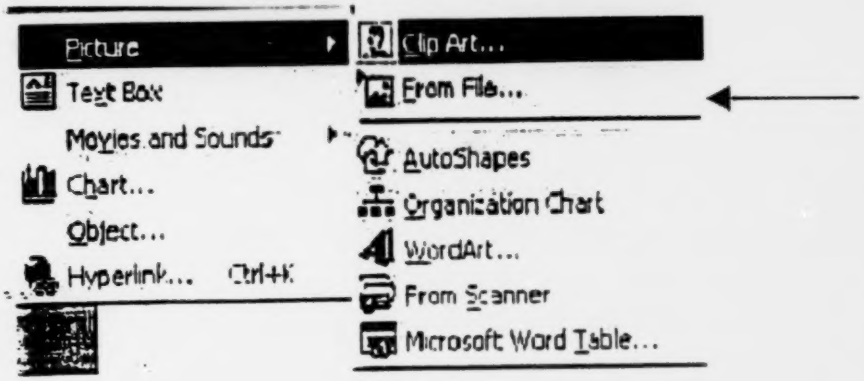
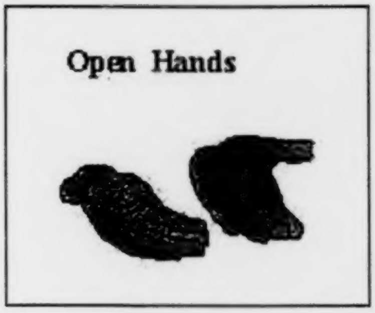

Picture
Text Box
Movies and Sounds
Chart...
Object...
Hyperlink... Ctrl+K
Clip Art...
From File...
AutoShapes
Organization Chart
WordArt...
From Scanner
Microsoft Word Table...



5. Review pictures until you locate one you want, click on Insert
6. Wait until the photo appears
7. Adjust photo to the center side of page.

8. Use the crop tool to adjust edges that you do not want.
9. Drag on the Corners only to resize in proportion.
10. Label with the concept. (example: FULL)
11. Repeat the steps to include all photos and all concepts.
12. Remember to Save your Show.

Directions for creating PowerPoint Concepts Slides:
Tutoring or evaluation activity - two photos per slide.

1. Insert new slide

2. Choose "title only" autolayout

3. Insert - Picture - From File (example: tray empty)

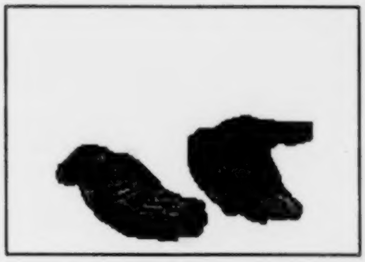
4. Review pictures until you locate one you want, click on Insert

5. Wait until the photo appears

6. Adjust photo to the left/right side or top/bottom of page.

7. Use the crop tool to adjust edges that you do not want.

8. Drag on the Corners only to resize in proportion so that it only take half the page.



9. Insert - Picture - From Slide

10. Choose photo that is opposite in concept but same location (example: tray full is the opposite of tray empty)

11. Wait until the photo appears

12. Adjust photo to the right side of page.

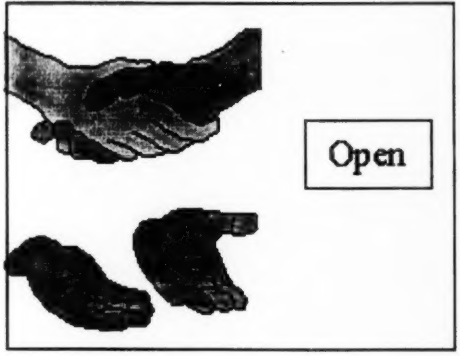
13. Use the crop tool to adjust edges that you do not want.

14. Drag on the Corners only to resize in proportion so that it only take half the page.

15. Label with one concept. (example: FULL)

16. Repeat the steps to create the same slide but label with the opposite concept. (example, next time label it empty)

17. Save the presentation.
For this activity, students will work with the teacher or peer tutor to point to the correct photo for the concept listed.



Directions for creating PowerPoint Concepts Slides - Creating feedback buttons

Activity with buttons and feedback- two photos per slide.

1. Use the presentation you created with two photos per slide. Save as a different name.

2. Go to the first page with two photos.

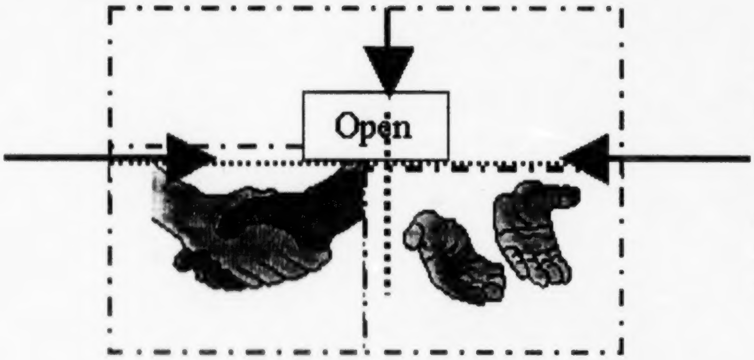
3. Create a blank button to cover the part of the page that you do not want to have the students click to go on.

    a. From the draw menu select autoshapes - action buttons.
    b. Choose the button with no design.
    c. Drag the button to cover the part of the page you want.
    d. The button will be in a color but we will change that.
    e. For the Hyperlink - choose NONE.
    f. When finished click - DONE.
    g. Now doubleclick on the button for the color and lines.
    h. Choose No fill for color and No Lines for lines

4. Now create a button for the correct answer.
    a. From the draw menu select autoshapes - action buttons.
    b. Choose the button with no design.
    c. Drag the button to cover the part of the page you want.
    d. The button will be in a color but we will change that.
    e. For the Hyperlink - choose Hyperlink to: Next Slide
    f. Click the button in front of Play Sound, then choose the sound to play.
    g. When finished click - DONE.
    h. Now doubleclick on the button for the color and lines.
    i. Choose No fill for color and No Lines for lines

5. Create as many buttons as needed to cover the whole page. You may choose to provide feedback when the student does not get the correct answer.

Button goes over the top part of the page,
to create a blank button so that students
cannot accidentally move to the next page.



Button goes over
the
Empty tray to
provide
Feedback that it
Is not correct

Button goes over
the
Full tray to provide
feedback that it is
correct and to
move to the next
slide.

Wissick, Langone, de Krafft, & Schweder, June 2000